

**ATTITUDES OF COMMUNITY MEMBERS TOWARD THE HUMAN RABIES IN
THE VHEMBE DISTRICT OF THE LIMPOPO PROVINCE, SOUTH AFRICA**

By

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SUPERVISOR: Professor Peter Thomas Sandy

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DEDICATION

I would like to dedicate this piece of work to my children - Floyd, Vutlhari and Fumani.

Student number: 6513174

DECLARATION

I declare that "ATTITUDES OF COMMUNITY MEMBERS TOWARD THE HUMAN RABIES IN THE VHEMBE DISTRICT OF THE LIMPOPO PROVINCE, SOUTH AFRICA" is my own work and that all sources I have used or quoted have been indicated and acknowledged by means of complete references and that this work has not been submitted before for any other degree at any other institution.

Ngobeni

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20 June 2018

Date: 20 June 2018

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- Lastly, my acknowledgements go to my supervisor, Professor Peter T. Sandy, without whose positive direction and advice, this report would never have been completed.

ACRONYMS

AfroREB	Africa Rabies Expert Bureau
ARES	Asian Rabies Elimination strategy
IPA	Interpretative Phenomenological Analysis
NICD	National Institute for Communicable Diseases laboratory
CFSPH	Centre for Food Security and Public Health ()
CDCP	Centers for Disease Control and Prevention
DALYs	Disability Associated Life Years
DHG	Department of Health Guideline
PARACON	Pan-African Rabies Control Network
PEP	Post-Exposure Prophylaxis
WHO	World Health Organization

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ABSTRACT

This study explored the attitudes of community members toward the Human Rabies in the Vhembe district of the Limpopo Province, South Africa. This study was underpinned by interpretative phenomenological analysis design. Data were collected using individual interviews of 20 participants and 6 focus groups consisting of six community members each. Both sets of interviews were audio recorded and transcribed verbatim. Data were analysed using interpretive phenomenological analysis framework for data analysis. Three super-ordinate themes emerged from data analysis: attitudes toward the Human Rabies, factors influencing attitudes toward the Human Rabies and tackling the Human Rabies. Results indicate that attitudes toward the Human Rabies has a direct influence on adherence to prevention and care approaches. Attitudes can be influenced by addressing training and educational needs and perceptions of prevention and care approaches. Recommendations are made to enhance adherence to prevention and care approaches for management of the Human Rabies.

KEY CONCEPTS

Attitudes, community member, control, Human Rabies, interpretative phenomenological analysis, management, prevention, Vhembe district

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CHAPTER 1

INTRODUCTION AND BACKGROUND TO THE RESEARCH PROBLEM

1.1 INTRODUCTION

The Human Rabies disease is a major global public health problem especially in sub-Saharan Africa and other developing countries. The disease has the highest case-to-fatality ratio relative to other infectious diseases (WHO 2013:90). To date, the only survivors of the disease are those who have received the rabies vaccine before the onset of the signs and symptoms. However, despite the availability of rabies vaccines and immunoglobulin in primary health facilities in South Africa, people are dying especially among all age groups in low-resource communities. This is because of the community members' failure to adhere to the prevention and care approaches for the management of the Human Rabies disease, and the vaccination and immunoglobulin requirements. Such lack of adherence is a function of the community members' lack of knowledge of the rabies disease and its effects. Specifically, the community members' non-adherence with the vaccination and immunoglobulin requirements is due to negative attitudes toward the rabies diseases. Yet there are no recorded research reports on the Human Rabies among rural communities in the Vhembe district of the Limpopo Province in South Africa. Therefore, there is need to explore the attitudes of community members toward the Human Rabies in the Vhembe district of this Province in South Africa.

In this chapter, the background to the research problem, statement of the research problem, the purpose and objectives, methodology, definitions of key terms and theoretical framework of the study are discussed. The significance and limitations of the study and the layout of the chapters are also provided.

1.2 BACKGROUND TO THE RESEARCH PROBLEM

The Human Rabies disease is a major global public health problem (Burgos-Cáceres 2011:326). It is a neglected zoonotic disease that is transmitted from infected animals to humans when the latter is bitten or scratched by the former (WHO 2013:40). It is a viral disease of the Central Nervous System, which affects all warm-blooded animals, including humans. There are a number of carnivorous animals that are implicated in

the transmission of the Human Rabies disease (e.g. bats, fox, wolves and dogs). Bats are noted to be associated with the transmission of the Human Rabies in the United States of America. In relation to the continent of Africa, the Human Rabies disease is mainly acquired from dogs, a view echoed in a range of studies. For example, the outcome of a study by Rimpi, Sangral, Kiran, Lachala, Dinesh Kumar, Tajali, Shora, Deepika, Dewan and SonikaSangra (2015:6) revealed that nearly 95% of the Human Rabies-related deaths in Africa are caused by exposure to dogs infected with the disease. However, a person can only be infected with the rabies virus when the saliva of an animal (e.g. a dog) infected with this virus enters a membrane or an open wound of that individual (Goldsmith, Renshaw, Clement, Abera, Assefa, Belete & Mekonen 2015:1423). The saliva of dogs with the rabies virus is often reported to contain a high viral load of the rabies virus, and thus considered a major medium for transmission of this infection (Mshelbwala, Ogunkoya, Abdullahi, Maikai & Atuman 2013:44). Arguably, in instances where the skin of the individual or person is intact, the risk of transmission of the virus through petting and touching is negligible. Although rare, the Human Rabies virus can also be transmitted through organ transplantation (Adedeji, Okonko, Eyarefe, Adedeji, Babalola, Ojezele, Nwanze & Amusan 2010:2328). However, such mode of transmission may occur if the donor organ is infected with the rabies virus (Abera, Assefa, Belete & Mekonen 2015:62).

The incubation period of the rabies virus is often 2–3 months, and fatal outcomes or deaths frequently occur within 2 weeks following the presentation of clinical symptoms, like fatigue and headache (Mshelbwala, Ogunkoya, Maikai & Atuman 2014:63). Even though rare, cases of a year incubation period are also reported in the literature sources (Baer 2000:256; Shankar, Mahadevan, Sapico, Ghodkirekar, Pinto & Madhusudana 2012:221). It is worth mentioning that a person infected with the rabies virus becomes infectious a week before the onset of the signs and symptoms of this disease. Once the virus reaches the brain of a person after having been bitten by an animal infected with the rabies virus, it replicates, resulting in presentation of clinical signs (Mshelbwala et al 2014: 398-404). There is often no hope for a cure once a person presents with signs and symptoms of the Human Rabies disease (Jackson 2013a, b). Examples of these signs and symptoms include pain and numbness or tingling at the site of the bite, and non-specific complaints, such as fatigue, headache, fever, apprehension, anxiety, agitation, irritability, insomnia, and depression.

The Human Rabies disease has the highest case-to-fatality ratio relative to other infectious diseases (WHO 2013:90). This assertion is a function of the view that no person with the signs and symptoms of the Human Rabies has been cured of this disease (Goldsmith et al 2015:1423). To date, the only survivors of the Human Rabies disease are those who have received the rabies vaccine before the onset of the signs and symptoms of the disease (Mshelbwala et al 2014: 398-404). Acknowledging this, the Human Rabies is a deadly disease that affects all age groups, and it is particularly prevalent in low-resource communities among children aged 15 years old and younger. The continents of Africa and Asia are the most affected areas of the world, with 95% of all human deaths related to rabies occurring in the same (WHO 2013:100). Yet this is a neglected area of research in these continents, and this is particularly the case in the continent of Africa (WHO 2013:100).

The Human Rabies is present in all continents and it is endemic in most African and Asian countries. The Human Rabies is estimated to cost 55000 deaths per year worldwide, and 56% of which occur in Asia and 44% in Africa, particularly in rural areas of both continents (WHO 2013:100). The mortality due to rabies is highest in Asia, with the highest incidence and deaths reported in India (Knobel, Cleaveland, Coleman, Fevre, & Meltzer 2005). In Bangladesh, rabies claims the lives of an estimated 2000–2500 people every year, and it is therefore ranked, in the context of its human impact, third relative to India and China (Tenzin, Wangdi, & Ward 2012:260-270). These figures are more likely to be an underestimate because of the absence of effective surveillance systems and reliable data, as not all cases or rabies related deaths are reported and recorded (Conference Report 2009:5027; WHO 2013:25). Despite this, the official figures indicate the scale of the problem. In Africa and Asia, rabies-related deaths are responsible for 1.74 million disability-adjusted life years lost per year, which is simply the expressed number of years lost due to ill health, disability or early death. It must be stated that the first officially recorded epidemic was in 1903 in Addis Ababa (WHO 2013:25).

As regards South Africa, the rabies disease was first confirmed in 1893 in a dog that was purported to have been imported from England. The Human Rabies was first confirmed in the North West province in 1923 following the deaths of two children bitten by a yellow mongoose (Department of Agriculture and Department of Health 2003:1). Since then, approximately, 10-30 cases of rabies are confirmed each year in

South Africa, and the main animal vector is the domestic dog (Kent, Naicker & Wood 2012: 2). In relation to the Limpopo Province, it experienced an outbreak of the Human Rabies in 2005–2006, which claimed the lives of 21 people. Since this period, the Limpopo Province experienced each year 1-4 rabies related human deaths caused by dog bites. Despite the implementation of surveillance systems, the cases of the Human Rabies are still seen in the Province of Limpopo, particularly in rural areas of the Vhembe district, where dog rabies control and elimination measures have proven difficult (Department of Agriculture and Department of Health 2003:1).

Limpopo Province health facilities see many patients consulting with histories of animal bites. The total number of patients who were treated for animal bites was 9718 in 2015, of which 7238 were from Vhembe district and 1033 from Mopani district of the province of Limpopo in South Africa. The total number of laboratory confirmed the Human Rabies and subsequent deaths in the Limpopo Province from 2001 to 2015 is 46 (National Institute for Communicable Diseases laboratory (NICD) 2016). These deaths could have been prevented if precautionary measures were taken. One approach recommended by the Rabies Advisory Group of South Africa is implementation of compulsory vaccination for all dogs and cats. Such a recommendation is based on the view that it is more cost effective to vaccinate dogs than to give post exposure treatment, and that only vaccination of dogs and elimination of the rabies virus in animals can prevent further transmission to humans (WHO 2013:40).

Countries that embarked on rabies elimination programmes have successfully reduced rabies in both animals and humans. North America and a number of Asian and Latin American countries have successfully controlled the incidence of the Human Rabies through sustained dog vaccination campaigns (Cleaveland, Kaare, Tiringa, Mlengeya & Barrat 2003:1965; Cleaveland, Kaare, Knobel & Laurenson 2006:43). Many dogs in South Africa are not immunized against rabies despite laws mandating vaccination, and Limpopo is no exception.

1.2 STATEMENT OF THE RESEARCH PROBLEM

Rabies is one of the infectious diseases with the highest human case fatality rate (almost 100%) in the world (WHO 2013:40; Centers for Disease Control and

Prevention (CDCP) (2017)). Africa contributes about 44% of the human deaths due to rabies, and the majority of the human cases result from dog bites (WHO 2013:40). In addition to human life losses, rabies is also a cause of substantial livestock losses (WHO 2012:55). The majority of the livestock losses result from scratches and/ or bites by other animals like rabid cats. Despite these consequences, rabies has been neglected (in the context of researching the same) in Africa. This is particularly the case in resource constrained rural areas, like the Vhembe district of the Limpopo Province in South Africa, where human deaths of approximately 4 occur every year.

In South Africa, all dogs and cats are required by statute to be vaccinated against rabies. Thus, the rabies vaccines are available throughout South Africa, as dog vaccination (particularly mass vaccination) is considered the most effective method of preventing rabies in humans (Weyer, Szmyd-Potapczuk, Lucille, Blumberg, Leman, Markotter, Swanepoel, Paweska, & Nel 2011:284). People continue to die of rabies in the Vhembe district of Limpopo despite the availability of rabies vaccines and immunoglobulin within its primary health facilities. This is because of the community members' failure to adhere to the prevention and care approaches in the Vhembe district. Such lack of adherence could be a function of the community members' lack of knowledge of the rabies disease and its effects. Specifically, the community members' non-adherence to prevention and care approaches are due to negative attitudes toward the rabies diseases. Yet there are no recorded research reports on the Human Rabies in Vhembe district. Hence, this planned research study, which explored the attitudes of community members toward the Human Rabies in the Vhembe district of the province of Limpopo in South Africa.

1.3 AIM OF THE STUDY

1.3.1 Research Purpose

The purpose of this study was twofold:

- The study explored the attitudes of community members toward the Human Rabies in the Vhembe district of the Limpopo Province in South Africa.

- The study also developed a conceptual model for adherence to prevention and care approaches among community members in the Vhembe district of the Limpopo Province, South Africa.

1.3.2 Research Objectives

The objectives are to:

- Explore community members' knowledge, feelings and beliefs of the Human Rabies.
- Explore community members' skills of preventing and controlling the Human Rabies.
- Explore factors that may promote community members' adherence to prevention and care approaches for the prevention and control of The Human Rabies in the Vhembe district of the Limpopo Province, South Africa.
- Explore factors that may hinder community members' adherence to prevention and care approaches for the prevention and control of The Human Rabies in the Vhembe district of the Limpopo Province, South Africa.
- Develop a conceptual model for enhancing community members' adherence to prevention and care approaches in the Vhembe district of the Limpopo Province, South Africa.

1.4 RESEARCH QUESTIONS

- What are the feelings, knowledge and beliefs of community members regarding the Human Rabies?
- What skills do community members have for preventing and controlling the Human Rabies?
- What are the factors that may promote community members' adherence to prevention and care approaches for the prevention and control of The Human Rabies in the Vhembe district of the Limpopo Province, South Africa?
- What are the factors that may hinder community members' adherence to prevention and care approaches for the prevention and control of The Human Rabies in the Vhembe district of the Limpopo Province, South Africa?

- What are the best practices for enhancing community members' adherence to prevention and care approaches?

1.5 SIGNIFICANCE OF THE STUDY

This study has resulted in the development of a conceptual model for enhancing adherence to prevention and care approaches among community members in the Vhembe district of the Limpopo Province, South Africa. Simply, the conceptual model would improve insight into adherence issues relating to prevention and control of rabies requirements in the Vhembe district. This model would be of practical utility in other districts in the Limpopo province.

The findings of this study can serve as a guide for improving the management and control of the Human Rabies in the Limpopo Province. The findings also may enable the Limpopo Department of Health to its quest for the elimination of rabies in order to meet the WHO target of the year 2020. The target is to eradicate the rabies virus mainly through vaccination of all possible hosts, including domestic dogs, wild animals and livestock.

1.6 DEFINITIONS OF KEY CONCEPTS

Concepts relevant to the research topic include the following:

Attitudes: This refers to a construct that represents an individual's degree of likes (favourable evaluative reaction) or dislikes (unfavourable evaluative reaction) for an item, or person (Taylor, Peplau, & Sears 2003:10). In this study, it will represent the degree to which community members think about and behave toward the Human Rabies disease in Vhembe district. In other words, an attitude in this study is about community members' knowledge, skills, beliefs, thought, and practices toward the Human Rabies.

Practice: This is about doing a particular thing, often regularly, in order to improve skills relating to that particular thing (Oxford Advanced Learners Dictionary 2010:20). In this study, practice shall mean the actual application or use of belief and knowledge of the Human Rabies.

Knowledge: These are facts, information and skills acquired through experience or education (Oxford Advanced Learners Dictionary 2010:40). It is about the theoretical or practical understanding of a subject. In context of this research, knowledge refers to the insight of the community members into the Human Rabies.

Subjective norm: This refers to the perceived expectations of others in relation to a particular behaviour, along with perceived social pressures (Ajzen 1988:25). In this study, subjective norm is about regulations and policies and people's perceptions and expectations of community members' behaviour toward the Human Rabies.

Perceived behavioural control: This refers to a person's perceived ease or beliefs of performing a behaviour (Schifter & Ajzen 1985:843). The perceived ease of performing behavior is influenced by the presence or absence of requisite resources and opportunities, which in this study could be knowledge and skills of the Human Rabies.

Intention: This refers to an indication of the degree of willingness or effort people plan to exert in order to perform behaviours (Fishbein & Ajzen 1975:16). Thus, for volitional behaviours, people would be expected to do what they intend to do.

Human Rabies: This is an acute, infectious, usually fatal viral disease of the central nervous system that is transmitted when infected animals (rabid) and bites non-infected persons or animals (Mshelbwala et al 2014: 398-404). In this study, this refers to a clinical compatible human case that is laboratory confirmed by testing at a state public health laboratory.

Post-exposure prophylaxis: Is a recommended treatment for the prevention of rabies in humans exposed to the rabies virus. It consists of local treatment of the wound, a course of potent and effective rabies vaccine, and the administration of rabies immunoglobulin when indicated (WHO 2013:30).

Primary Health Care facility: This refers to clinics, health centres, gateway clinics and mobile clinics that offer care to people for various conditions, including the Human Rabies.

1.7 THEORETICAL/META-THEORETICAL GROUNDING/THEORETICAL FRAMEWORK

The theoretical framework of this study is the Theory of Planned Behaviour (Ajzen 1991:180). See figure 1.1 for a diagrammatical representation of the Theory of Planned Behaviour. The Theory of Planned Behaviour regards intention as the primary predictor of behaviour, and maintains that behavioural intentions are influenced by attitudes, subjective norms and perceived behavioural control (Ajzen 1991:180). Attitudes refer to a process of categorisation of a stimulus along an evaluative dimension. The categorisation of the stimulus (something or someone) as favourable or unfavourable is based upon affective, behavioural and cognitive information (Taylor, Peplau & Sears 2003:233). This tripartite aspect of an attitude is a recognition of the view that people have a choice of three ways of responding to a stimulus, like rabies. These choices for responding are cognitive, affective and behavioural. The affective component refers to the feelings or emotions people may have about the stimulus object, while behavioural responses are overt behaviours individuals may display toward the same (Sandy & Shaw 2012:64). With regards to the cognitive responses, these are in essence the knowledge and beliefs a person may have about the stimulus object, which, in this study is the Human Rabies disease (Taylor et al 2003:233). Subjective norms are beliefs held by people that specific individuals or groups think they should or should not act in a specific manner (Ajzen 1988:25). The degree of influence of the subjective norm and attitude on intention to perform behaviour may vary from person to person. Perceived behavioural control refers to a person's perceived ease of performing behaviour taking into consideration some realistic constraints that may exist (Schifter & Ajzen 1985:843). Perceived behavioural control have a direct influence on intention and is not mediated by attitude and subjective norms (Ajzen 1985:183). In addition to the influence of significant others (subjective norm), perceived behavioural control also play a significant part in influencing attitudes of people toward specific behaviours (Ajzen & Madden 1986:453). Thus, the Theory of Planned Behaviour is considered to have considerable utility in explaining attitudes

toward behaviours, such as adherence to prevention and care approaches for the management of the Human Rabies disease.

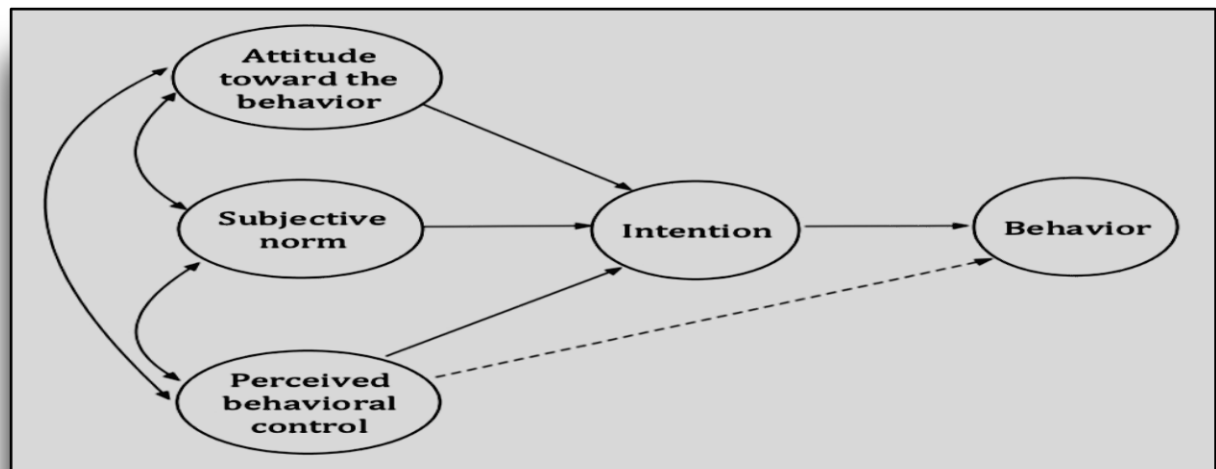


Figure 1.1: The Theory of Planned Behaviour (Ajzen 1991:180)

1.8 RESEARCH DESIGN AND METHODS

The proposed study adopted a qualitative methodology, for a number of reasons. One of the intentions of the proposed study was to explore and develop understanding of community members' attitudes toward the Human Rabies. Such understanding requires the use of a qualitative research methodology to explore the personal experiences, skills, practices, perceptions, beliefs and meanings, which individuals hold for this phenomenon (Creswell 2007:60). Qualitative research methodology therefore captures the concerns of the current research, as its focus on people's unique experiences of the Human Rabies (Creswell & Clark 2007:115; Creswell & Creswell 2013:20). Qualitative methodology has distinct characteristics; some of these relate to people's individual experiences and the uniqueness of their individual responses to social situations, like prevention and control of the Human Rabies, including attitudes toward this (Salkind 2010:213). The concerns of the researcher of this study was to understand the phenomenon of the Human Rabies from the perspectives of individual community members of the Vhembe district, re-confirms the affinity between the need to control and prevent this disease and the underlying tenet of qualitative research, namely the exploration of people's individual experiences and beliefs (Mouton 1996:23). Pope and May (1995:42) echo this view and conclude that,

the reason why qualitative research has so much to offer to the public health discipline is that it places great emphasis on offering people-centred holistic support. According to Pope and May (1995:42) adopting such a stance allows qualitative methodology to “reach parts other methods cannot reach”. Simply put, qualitative methodology is the only methodology that enables researchers to understand people’s idiosyncratic or personal experiences and perceptions (Bryman, A. Bell, E., Hirschsohn, P., du Toit, J., dos Santos, A., Wagner, C., van Aardt, I. and Masenge 2016:22). Thus, any attempt to understand attitudes of community members toward the Human Rabies, and factors that influence them, must therefore be based on a methodology that is sensitive to the subjective-personal experience and how that may vary from one person to the next.

1.8.1 The paradigm of the study

A paradigm is a set of beliefs that guides or shapes research projects (Morgan 2007:50). This study adopted a phenomenological paradigm because it is aligned with its methodology, and methods of data collection and analysis. A phenomenological paradigm, like other paradigms, consists of a number of interrelated assumptions. The first assumption is that the truth or reality of the world or phenomenon is multiple (ontology), and the world is perceived to be socially constructed and subjective (Grbich 2007:8). The second is that individuals and groups of individuals have experiences that make sense within their lives or world, and research does not have to be carried out to enable individuals to make sense or understand their world (axiology) (Creswell 2007:20, Creswell 2014: 18). However, it is possible, through research to capture and understand the meanings of an individual’s or group’s lived experience with a world or phenomenon and the researcher (observer) is considered a part of the sense making process (epistemology) (Schram 2003:20; Ratner 2008:12). It is the perceptions of participants that provide researchers with information about how an individual or group of individuals live in and reacts to the world or phenomenon (Schram 2003:33). The third assumption is that people exist within their own contexts or cultural settings, and the reality or truth of a phenomenon does not reside in the phenomenon, but resides within participants’ talk about, perceptions of, and reactions to the phenomenon (axiology) (Schram 2003:40). The phenomenological assumptions described neatly align themselves with the researcher’s beliefs, including the aims and objectives of

this study. These assumptions influenced the choice of the sampling, data collection and data analysis approaches adopted in this study.

1.9 SCOPE AND LIMITATIONS

The study was conducted in a single district, Vhembe, and it used a criterion purposive sampling approach to identify and recruit participants. Community members of this district may be different from those in other districts in the context of their experiences and attitudes toward the Human Rabies. Additionally, the findings of this study was based on retrospective accounts of experiences of rabies, and such accounts are usually subject to memory bias. They are also potentially subject to the social desirability effect, whereby participants might 'police' their responses in order to avoid negative judgments by researchers

1.10 STRUCTURE OF DISSERTATION

This dissertation consists of a number of chapters and subsections. Resumes of each of these are offered here to allow readers to follow and understand discussions on issues presented.

Chapter one gives a general introduction to the study, including the formulation of the problem, the purpose and objectives of the study, and throws light on definition of the key terms used in the study. A brief description of the study research methodology is also provided. Chapter two focuses on the literature reviewed. It highlights the literature search strategy, appraisal of identified literature and themes, which emerged from the literature reviewed. Chapter three provides detailed information on the research approach, and research design. It also includes descriptions of the study site, sampling method, data collection and analysis, measures to ensure trustworthiness and ethical issues related to the study. Chapter four presents the research findings. It also provides an explanation of the process followed for the model development, and presents a description of the model developed, including its structure. Chapter five presents a general discussion of research findings, recommendations and conclusions based on the findings of the study. It also includes a discussion of the conceptual model developed.

1.11 SUMMARY

This chapter presented an overview of the study that includes its background, problem statement, and purpose, objectives, methodology, and its significance. The next chapter discusses the literature relevant to the phenomena of attitudes toward the Human Rabies.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

Lack of knowledge regarding disease signs and symptoms, and preventative measures thereof poses a danger to society. It could result in premature deaths that could be prevented if infected individuals or those around them were knowledgeable about the disease (WHO 2014:2). It is expected that people would be knowledgeable about rabies, as it is one of the oldest infectious diseases affecting both animals and humans (Weyer 2015:40). Rabies has reportedly been associated with animal bites for over 3000 years (Baker 2013). The disease is managed through vaccination of animals (especially dogs) and humans (Weyer 2015:40). Acknowledging this, pre-exposure prophylaxis is required to be given to anyone who is at an increased risk of exposure to the rabies virus, as a result of their occupation or residence (WHO 2014:2). Examples of such categories of people that are at an increased risk of contracting the rabies virus include individuals working with live rabies virus i.e. laboratory staff, veterinarians, animal handlers and wildlife officers. Added to this, post-exposure prophylaxis (PEP) should be given to humans bitten by an infected animal (rabid) (WHO 2014:2). Simply, it should not await the results of a laboratory diagnosis or be delayed by dog observation when rabies is suspected (WHO 2014:2).

This chapter discusses the literature reviewed that mainly focuses on the analysis and synthesis of the existing literature relevant to the subject studied.

2.2 EPIDEMIOLOGY OF THE HUMAN RABIES

Zoonotic diseases are transmissible from animals to humans, such as the Human Rabies, are known to have significant impact on public health globally (Susan Cherian et al 2015). There is lack of progress in the control of the Human Rabies in many countries all around the world (Nel, Taylor, Balaam & Doyle 2015:1). Rabies is recognized as one of the most neglected zoonotic disease that is primarily impacting poor rural communities of the developing world (WHO 2016:13). Globally, there are four endemic genotypes of the lyssa virus; the virus that causes the Human Rabies. The most common one is genotype 1 (rabies virus); and then there is genotype 2

(lagos bat virus), genotype 3 (mokola virus) and genotype 4 (duvenhage virus). Human infections are mostly due to these four genotypes of rabies virus; though duvenhage virus has been associated with at least two the Human Rabies cases in South Africa (von Teichman, Thomson, Meredith & Nel 1995:73-82). The challenge with rabies is that its incubation period depends on the severity of exposure to the virus, the age of the infected individual, the site bitten and the strain of the virus. According to the Centre for Food Security and Public Health (2012:3), the incubation period in humans can be a few days to several years. The incubation period is reported to be shorter if the virus is inoculated closer to the central nervous system or in an area that is more highly innervated like a head or face. Exposure may have occurred some days or many years before the onset of symptoms; which also depend on the same factors determining the incubation period (Centre for Food Security and Public Health (CFSPH) 2012:4).

Rabies is known to infect animals particularly carnivores, and domestic dog populations are the most significant reservoir and vector for the Human Rabies in the developing world (Wallace et al 2016; Kularatne et al 2016). However, vaccines for dogs and humans have been used successfully to eliminate the disease in Western Europe, North America and more recently, Latin America. In contrast, in developing world, millions of people are still at risk of dying from dog rabies, with more than 20,000 human deaths annually in Africa and 35,000 human deaths annually in Asia (Hampson et al 2015:1). Children (below 15 years of age) tend to be the most affected by rabies because they have closer contact with pets (mainly dogs). The children are at a higher risk because they often suffer multiple bites from dogs, and the bites are usually on their faces and heads. The epidemiology of rabies in southern Africa have been highlighted in recent studies (Pfukenyi et al 2009; Muleya et al 2012; Hergert & Nel 2013; Kubheka et al 2013; Sabeta et al 2013) and the Human Rabies is among the most neglected zoonotic diseases in southern Africa (Hotez & Kamath 2009: e412). In South Africa, since the first confirmed rabies case in 1893 and the first confirmed Human Rabies in the North West province in 1923 (Department of Agriculture and Department of Health 2003:1), approximately, 10-30 cases of rabies are confirmed each year, and the main animal vector is the domestic dog (Kent, Naicker & Wood 2012: 2). Rabies is fatal in humans and children are at a high risk, and due to these reasons, it is of significant public health importance globally and in particular, in

developing countries in sub-Sahara Africa, including South Africa. Rabies is a notifiable disease in South Africa, according to Regulation 328 of the Health Act of 1977.

2.3 TRANSMISSION OF RABIES VIRUS

The rabies virus is mostly found in salivary glands, tissues and fluids of the central nervous system of rabid animals (Tarig et al 1991; Mshelbwala et al 2013: 398-404). As a result, most of human infections occur when an infected animal's saliva gains access to the body through an open wound; usually through a bite from an infected animal or a lick, but also through a mucous surface, such as the eyes, nose, or mouth (CFSPH 2012:2).

According to the Acute Communicable Disease Manual 2014, rabies transmission from person to person is remotely possible. Transmission can also occur by ingestion of infected material or by inhalation of contaminated air (e.g., in caves where bats roost). It has been observed in other countries, however, that the Rabies virus can be transmitted through handling and skinning of infected animals; a rare but possible incidence (Tarig et al 1991; Mshelbwala et al 2013: 398-404). Dogs whose vaccination is unknown, dog meat processors (butchers) and consumers are among the high-risk groups for rabies infection (CFSPH 2012:2). This happens in countries where dog meat is consumed. It is rather unfortunate that humans are also infected with the rabies virus through non-bite exposures when handling high concentrations of the virus at vaccine facilities, research laboratories, and diagnosis laboratories that deals with infected tissues (Mshelbwala et al 2013: 398-404). Essentially, humans can be infected with the rabies virus in multiple ways. This indicates that awareness of the sign and symptoms of the Human Rabies is of utmost importance. Avoidance of handling and eating meat of rabid animals showing sign and symptoms of the disease and providing a response to this would help.

2.4 SIGNS AND SYMPTOMS OF THE HUMAN RABIES

Rabies should be suspected from any patient with history of animal bite, especially dogs, and at least 15 terrestrial mammals in particular carnivores including bats, jackals, or coyotes (Kularatne et al 2016). The first symptoms of rabies include flu-like symptoms, general weakness or discomfort, fever, or headache (Adle-Biasette,

Bourhy, Gisselbrecht, Chrétien, Wingertsmann, Baudrimont, Rotivel, Godeau & Gray 1996:415). There may be also discomfort or a prickling or itching sensation at the site of the bite, progressing within days to symptoms of cerebral dysfunction, anxiety, confusion, and agitation (Adle-Biasette et al 1966:415; Kularatne et al 2016). As the disease progresses, the person may experience delirium, abnormal behaviour, hallucinations, and insomnia (Adle-Biasette et al 1996:415). The acute period of disease typically ends after 2 to 10 days. Once clinical signs of rabies appear, the disease is often fatal, and treatment is typically supportive (Adle-Biasette et al 1996:415; Wallace et al 2016; Kularatne et al 2016). This suggests that there is no effective treatment once the patient starts showing the signs and symptoms of rabies. According to the review by Baker (2013), upon infection, rabies develops in two ways;

1. Furious (encephalitic). At this phase, the patient will experience frequent shifts between episodes of excitement and hallucinations, and they will usually suffer from hydrophobia and aerophobia. The patient's death is expected within seven days of being infected.
2. Dumb (paralytic). At this phase, the patient will be weak due to the flaccidity and weakness of muscles, and death is often expected within two weeks.

2.5 PREVENTION AND MANAGEMENT OF THE HUMAN RABIES

The most cost-effective measure to protect humans from rabies is dog vaccination (Asian Rabies Elimination strategy (ARES) 2016:15). A mass dog vaccination where at least 70% of dog population is covered within the shortest period possible is preferred (Africa Rabies Expert Bureau (AfroREB) 2009:5027–5032). Once a rabid animal has bitten a person, the only way to potentially save that person's life is to provide post exposure prophylaxis and rabies immunoglobulin coupled with proper wound management (ARES 2016:15). The sooner treatment is started, the more likely a person would be prevented from developing the rabies disease.

Once symptoms appear, the rabies vaccine and immunoglobulin would not be effective and death is almost certain (Adle-Biasette et al 1996:415; Wallace et al 2016; Kularatne et al 2016). Disease prevention and proper management thereof, would go a long way in saving costs that might be incurred when having to deal with curing persons infected with the rabies virus. Costs incurred from rabies vaccination

and immunoglobulin for managing the disease were estimated at approximately US \$8.6 billion globally in 2014 (Weyer 2015:40). Cost-effectiveness studies on the public health burden of rabies control strategies in some countries have been reported in the literature (Wilde et al 1999; Goswami et al 2005; Kayali et al 2006). However, it is important to note that data on cost of rabies vaccination and the reported death cases due to the Human Rabies can vary from country to country and among regions within a particular country (Fahrion, Taylor, Hampson, Abela-Ridderc & Nel 2017: 231-243; Mautia, Traoré, Hattendorf, Schelling, Wasniewski, Schereffer, Zinsstag, & Cliquet 2017: 194–202). For instance, in Bhutan, the average cost per dog vaccination was estimated at US\$1.66 compared to US\$1.30 in Thailand and Tunisia (Bogel & Meslin 1990), US\$2.14 in Chad (Edelsten 1995) and US\$2.7 in Malawi (Zinsstag et al 2007). According to estimates by the National Rabies Advisory Group of South Africa, South Africa spent about R70 million (USD\$ 6 million) for purchasing vaccine and immunoglobulin in 2014 alone. Reduction of these costs requires that people are knowledgeable about rabies; an approach that would contribute to reduce the rate of infection. Due to poor surveillance systems and irregular reporting of rabies cases in developing countries, it is difficult to establish the current rate of infection of the Human Rabies (Nel 2013:259). Currently, despite the availability of cheap and effective dog vaccines, the highest rabies death rates in the world occur in the developing world. Asia is the most affected and, Africa is the second continent most affected by rabies with an estimated 24,000 (44%) of the 55,000 annual rabies related deaths worldwide (Knobel et al. 2005:360). The failure of rabies control programmes in Africa and Asia is attributed to poverty and lack of awareness among the population (Kaare et al 2009:152). The problem is compounded by scarce infrastructure for rabies exposure management, and a lack of sufficient modern vaccines and immunoglobulins for post-exposure prophylaxis (PEP) (AfroREB 2009:5027–5032). However, compulsory vaccination has been used successfully to control rabies in Malaysia, a less developed country (Kaare et al 2009:152). Interestingly, two African countries (Uganda and Zimbabwe) have also reported reduction of canine rabies using vaccination strategies (Kaare et al 2009:152). Vaccination of dogs or pets in general is required to control rabies; and humans who work with animals are advised to be vaccinated as well.

There are vaccines used for both pre-exposure and post-exposure. Pre-exposure vaccination is not, however, a means to avoid post-exposure prophylaxis; it only

minimizes the number of vaccine doses required for post-exposure (Goswami, Plun-Favreau, Nicoloyannis, Sampath, Siddiqui, & Zinsou 2005: 2970–6). It also means that the patient will not need immunoglobulin post-exposure (Baker 2013). Immunoglobulin post-exposure must be administered when the wound is severe, deep and with large rabies viral load or a case of Category III rabies exposure. The WHO guidelines stipulates that, in cases of severe (category III) exposure, rabies exposure requires post-exposure vaccination, and rabies immunoglobulins (WHO 2005:111-121). The vaccine administered upon treatment of animal wounds, and the immunoglobulin, are currently available in South Africa and at all health facilities in the country. In South Africa, the rabies vaccines and immunoglobulin are available in all primary health facilities but people are still dying of the Human Rabies especially among all age groups in low-resource communities such as the Vhembe district of Limpopo Province.

2.6 HISTORY OF THE HUMAN RABIES

Rabies disease has been known since ancient times, pertaining to deaths from “lyssa” dogs in Mesopotamia dating back to 2 300 BC. The Greek philosopher, Democritus was the first to describe canine rabies in 500 BC (Wilkinson 2002). In 400 BC, Aristotle discussed the disease but did not make the connection between the human and dog diseases (Steele & Fernandez 1991). The Greeks referred to rabies as “lyssa” or “lytta”, meaning “madness”, while the Latin word “rabies” is derived from the Sanskrit word “rabhas” meaning “to do violence” (Wilkinson 2002).

Rabies has been the subject of myths and legends across time and cultures (Steele & Fernandez 1991). The common cures for rabies during that pre-historic times was hot and cold baths and rubbing of the wound with salt (Steele & Fernandez 1991). In the first century AD, a physician named Celsus indicated that the bites of animals were dangerous to both man and beast. The same physician added that the “poison” was transmitted through saliva, and recommended for the wound to be treated either with caustic agents or fire (Steele & Fernandez 1991).

The first officially recorded epidemic of rabies was in 1903 in Addis Ababa (WHO 2013:25). New Jersey in the United States of America, had a canine rabies epidemic in 1939. In that year, it was reported that about 675 dogs and four humans died of rabies. This incident resulted in the development and implementation of a national

programme in 1942, that involved a mass vaccination of dogs, including stray animals. The outcome of the implementation of the programme was complete elimination of rabies cases with the last canine case noted in 1956. Rabies was noted to spread throughout the United States of America within three years from 1956 to 1959 (WHO 2013:25). This was in part attributed to the rabbit raccoons that were believed to have been imported by hunters from Florida (WHO 2013:25). Specifically, they contributed to the spread of rabies at a rate of approximately 35 to 50 miles per year (WHO 2013:25).

Since 1885, Asia and Africa put together accounts for more than 60% of an estimated 70,000 people worldwide, who died of rabies annually, despite the existence of post exposure vaccines and the availability of cheap and effective dog vaccines (Tenzin, Dhand, Dorjee & Ward 2011: 220-225; Tenzin et al 2012:260). In South Africa, dog rabies has been reported to have been a public health concern over the past 50 years (Weyer 2015:40). Rabies was established in dogs in the KwaZulu-Natal Province in the 1960s; but it was brought under control until reintroduction in the 1980s (Weyer 2015:40).

2.7 INCIDENCE AND PREVALENCE OF THE HUMAN RABIES

In general, there has been a drastic decrease in the incidence and prevalence of the Human Rabies globally. Some countries in the Americas, Asia and Middle East, Europe, Oceania, Antarctica and Africa, are listed as rabies free by the Centres for Disease Control and Prevention (2017:2). In most of these countries, elimination of the rabies virus through vaccination of domestic pets played a major role in the stark reduction in the Human Rabies related deaths. In addition, vaccination of wildlife, promoting the Human Rabies awareness campaigns, and timely administration of post exposure prophylaxis, have all helped in reducing canine rabies in developed world countries. For example, in the United States, the incidence and prevalence of the Human Rabies has been reduced since 2007, with only 1 to 3 rabies cases reported annually. Since 2008, 23 cases of the Human Rabies were reported, of which 8 of the cases were due to exposures outside of the United States (Centres for Disease Control and Prevention (CDCP) 2017:2). In the United Kingdom, the introduction of compulsory quarantine for dogs resulted in a stark reduction in The Human Rabies and the country was declared rabies-free in 1922 (Johnson, Brookes, Fooks & Ross

2005). In Poland, 13 years of oral rabies vaccination resulted in a decrease of 97% (from 3,084 cases in 1992 to 82 in 2006) in the incidence of rabies in the country (Smreczak et al 2008: 249-256) and in Germany, a similar drastic reduction in rabies incidence was reported after 20 years of oral rabies vaccination (Müller et al 2005: 229-231). In Central and Eastern Europe, very few countries are rabies free, and others are close to becoming a rabies-free (van der Poel et al 2006:315-324)

In contrast to Europe, Asia has the highest incidence and prevalence of the Human Rabies worldwide. For example, India has the highest rate of the Human Rabies in worldwide, and is a major contributor to the estimated 31,000 human deaths due to rabies annually in Asia (WHO 2005:111-121). In China, the incidence and prevalence of the Human Rabies is also high with more than 5,200 deaths reported annually during the period of 1987 – 1989, and in 1981, the highest number of cases was recorded, with 7037 the Human Rabies cases reported (Zhou, Vong, Liu, Li, Mu, Wang, Yin & Yu 2016: e0004874). However, with a mass dog vaccination strategy, due to the availability of cheap and effective dog vaccines, there has been remarkable reductions in the number of rabies cases in some Asian countries (Asian Rabies Elimination strategy, 2016:15). For example, Japan is considered a rabies-free country with only 3 imported cases of the Human Rabies reported for over a 50-year period (Takahashi-Omoe, Omoe & Okabe 2008: 1368-1374). Malaysia was able to successfully control the Human Rabies with a compulsory dog vaccination strategy (Kaare et al 2009:152). The use of modern vaccines for canine rabies played a major role in reducing drastically the number of the Human Rabies cases in the Thailand (WHO 2005:111-121).

After Asia, Africa is the second continent most affected by the Human Rabies with an estimated 44% of the 55,000 annual rabies deaths worldwide (Knobel et al 2005:360). For instance, in N'Djamena alone, which is the capital of Chad, the Human Rabies mortality was estimated to be 7 per million per year (Frey et al 2013:1555–1562) and in Mali, the Human Rabies incidence was estimated at 0.37 cases per 100,000 inhabitants in the capital city, Bamako, between 2007 and 2012 (Kone (2013). However, it is important to note that most the Human Rabies cases are under reported especially for rural Africa mainly due to poor surveillance and reporting systems (Knobel et al 2005:360–368). At a meeting of the Africa Rabies Expert Bureau (AfroREB) held in Senegal in 2009, in which 15 French speaking Western and Central

African countries and the Southern and Eastern African Rabies group, were represented, it was unanimously agreed that the Human Rabies incidences is largely under reported in Africa (AfroREB 2009:5027–5032). According to Knobel et al (2005:360–368), the actual numbers of the Human Rabies cases especially in rural Africa are between 100 and 160 times higher than the reported figures. In South Africa, for example, recently confirmed the Human Rabies cases were spread geographically across four provinces in the country (Limpopo, Mpumalanga, Eastern Cape and KwaZulu-Natal) and other reported cases in the Free State and Eastern Cape provinces were not confirmed using laboratory test (Cohen et al. 2007: 1879-86). According to Ngubane (2017), annually, about a dozen cases of the Human Rabies were confirmed and reported especially in the above mentioned provinces. In December 2016, the Department of Agriculture, Forestry and Fisheries reported the Human Rabies incidences in various provinces as follows; Free State (4), Gauteng (1), KwaZulu Natal (8), Limpopo (1), and North West (2). This adds up to a total of 16 reported incidences in just one month (DAFF 2017). A National Institute for Communicable Disease report revealed that from the first of January to May 2017 there was only 1 reported case of the human Rabies; which was a 5-year-old child from the Eastern Cape who died on the 6th of February 2017. There was also a 7-year-old Namibian boy who died shortly after being admitted at Oshakati hospital; the boy was apparently living in a home with unvaccinated dogs (NICD 2017). According to Weyer (2015:40), cases of rabies were reported in Vhembe district of the Limpopo Province in 2004 following a rabies free period of two decades. However, the sources of the cases reported were traced to Zimbabwe following molecular investigations. In the period from 2008 to 2013, there were 304 bovine (cattle), 71 caprine (goats), and 26 ovine (sheep) reported to have been infected with rabies.

About 98% of the Human Rabies cases occur in developing countries that possess large numbers of dogs; the majority of which are stray dogs. Most of the Human Rabies incidences due to domestic dogs are reported to be in developing countries in Africa and Asia (Weyer, 2015:40).

2.8. THE BURDEN OF THE HUMAN RABIES

The Human Rabies is present in 150 countries and on all continents, except for Antarctica (WHO 2005:111-121). The Human Rabies is responsible for thousands of

deaths annually (Knobel et al. 2005:360). It is estimated to account for approximately 59 000 deaths or more worldwide every year (Knobel et al 2005:360). The highest incidence of deaths is reported in India, followed by Africa (Knobel et al 2005). The World Health Organization reported about 35,000 people die of rabies in India every year (WHO 2005:111-121). This death rate, which accounts for about 81% of the global deaths, is associated with dog bites (WHO 2005:111-121). However, there might be many unreported incidences, and this could be the case particularly in instances where families were not knowledgeable about rabies and its signs and symptoms.

As regards Africa, 560 people die of rabies annually in Kenya, and in 2011, 2012, and 2013, there were 21, 42, and 38 dog rabies cases reported respectively in the same (Haimbodi 2014:141-146). Confirmed rabies cases in humans have ranged between 5 and 26 cases per year for decades, and 83% of these cases were children aged 16 years and younger (Haimbodi et al 2014:141-146). In relation to South Africa, rabies is associated with 20 and 30 deaths per year, and children between 0 – 19 years are mostly affected. Jackals are reported to be the principal mode of transmission of canid strain virus in Limpopo Province (Department of Health Guideline (DHG)1997).

It is worth noting that a minimum of 10 000 patients per year worldwide, consult or see a healthcare professional because of an animal bite, the majority of which are reported to be dog bites (Meslin & Briggs 2013:292). However, due to poor surveillance and reporting systems in Africa, literature on reports on incidence of animal bites is scarce, which is the case for the Vhembe district community in Limpopo Province in South Africa. Nevertheless, it is important to stress that, all animal bites victims must be given post-exposure prophylaxis as it is difficult to know whether the animal was infected with the rabies virus. Besides costs to the local government and the country at large, precious lives are lost each year due to infections with the rabies virus. According to Knobel et al (2005:360), around 1.74 million disability associated life years (DALYs) are lost each year due to the Human Rabies and in addition, 0.04 million DALYs are lost through morbidity and mortality following side-effects of unsafe nerve-tissue vaccines used in each year.

2.9. ATTITUDES TOWARD THE HUMAN RABIES

Globally, attitudes toward the Human Rabies is positive especially in the developed world, where the canine rabies have been eradicated in some countries through mass vaccinations programmes and rabies awareness campaigns. To a large extent, the incidence and prevalence of the Human Rabies disease has been reduced drastically in countries in the developed world. This was mainly due to the availability of cheap canine and wildlife vaccines, and pre-and post-exposure prophylaxis, coupled with research efforts and effective surveillance and reporting systems in those countries. However, in contrast, the attitudes toward the Human Rabies in Asia and Africa is yet to be desired. In China, for example, public health awareness on the Human Rabies disease is generally very low and according to findings of a population-based survey in Hubei Province in the county, only 31% of community inhabitants had knowledge that rabies virus may be carried by healthy dogs (Duoshuan 2007:644–6). In Africa, information on attitudes toward the Human Rabies is scanty in the literature and only few countries have reports on the knowledge, attitudes and practices toward the disease. For example, Chad (Kayali et al 2003:739–744; Mindekem et al 2005:53–58), Zimbabwe (Butler 1995:81–94), Namibia (Haimbodi et al 2014:141-146) and Mali (Mauti et al 2017:194–202) are among the African countries with reports on the attitudes toward the Human Rabies. According to these authors, generally there are educational deficits and insufficient knowledge and awareness about the Human Rabies disease especially in resource-poor communities such as those in the Vhembe district in the Limpopo Province in South Africa.

Knowledge about rabies, including preventative measures, causes, and how to go about getting help post suspected infection would go a long way in reducing the number of annual deaths in communities and the South African country as a whole. There is currently no available nation-wide data that clearly indicates the extent of the Rabies virus infection; however, there is some documented information in a few areas and provinces in the literature. A study conducted in the KwaZulu Natal Province (where Rabies is known to be endemic in South Africa) from 2009 to 2011 indicated that 96% of respondents had knowledge on rabies (Hergert 2003). There is, however, not enough reports in the literature on the South African context concerning knowledge about the Rabies virus in general.

Knowledge about the Rabies virus infecting both animals and humans is crucial for various reasons. Firstly, it would help in reducing the number of infection cases in each province in South Africa, countries in other continents, and worldwide. Secondly, it would result in improvement in the overall management of the disease; thereby reducing costs incurred in vaccinations and immunoglobulin post-exposure. Lastly, it would reduce the number of people eventually dying post exposure to the Rabies virus.

The history of both the dog and the Human Rabies shows that the virus has been known long enough for nations to be well informed about preventative measures and management. It is rather appalling to learn from research reports that there might also be health officials who are not knowledgeable about Rabies. This is still the case regardless of the pledge by participants from African countries who attended the Pan-African Rabies Control Network (PARACON) held in June 2015 in Johannesburg, South Africa; the pledge was for taking strategic measures aimed at eliminating the Rabies virus by the year 2030. All is not lost, however, as the strategies might make some change in future and possibly be rendered effective in eliminating the Rabies virus. In South Africa, there is already reports of a reduction of dog Rabies in KwaZulu Natal in recent years. This is said to be due to collaborations between local stakeholders and the Bill and Melinda Gates Foundation project; an international entity (Weyer 2015:40). There was also a decrease in dog Rabies in Mpumalanga over a period of 3 years at the time the research report by Weyer (2015:40) was compiled. These reductions in dog infections might have also resulted in decreases of the incidence of the Human Rabies as most infections are reported to be from dog bites. There is, however, no research documentation reports available at present regarding reductions in incidence of the Human Rabies, especially in rural communities in the Limpopo Province in South Africa.

2.6. CONCLUSIONS

This chapter has discussed the literature reviewed that mainly focused on the epidemiology, transmission, signs and symptoms of the Human Rabies disease. It also reviewed literature on the prevention and management, and incidence and prevalence, including the burden of the disease and the attitudes toward the Human

Rabies. The next chapter presents the discussion of the research design and methods used to achieve the aim and objectives of the study.

CHAPTER 3

RESEARCH DESIGN AND METHOD

3.1 INTRODUCTION

This chapter presents a discussion of the research design and methods used to achieve the aim and objectives of the study. In relation to the methods, these include sampling, data collection and analysis methods, and approaches used in ensuring the quality or trustworthiness of the study and its findings. This chapter also includes ethical considerations relevant to the study.

3.2 RESEARCH DESIGN

A research design is the overall structure or plan of the research (Bowling 2009:143). It is the plan for conducting the study (Creswell 2007:49). Babbie (2013:87) states that it is the entire process of research: conceptualising a problem, writing research questions, collecting data, analysis, interpretation and report writing. Babbie (2013:87) goes further by stating that a research design is all about determining what one is going to observe and analyse, why and how.

This study adopts an interpretative phenomenological analysis study design (IPA) (Smith 2005:111). This was considered the most suitable design for exploring community members' attitudes toward the Human Rabies for a number of reasons. Both researcher and participants are living within a hermeneutic cycle, attributing meaning to or trying to make sense of the world they live in. Smith (2005:111) therefore refers to people as "meaning making machines", generating meanings of the world through active engagement. Interpretative phenomenological analysis gives prime place to understanding the meanings of the lived world of individuals. It focuses on individual's personal perceptions of the world or subject of study that is believed to sit neatly in their talk. Understanding meanings inherent in individuals' or participants' talk therefore occupies a central position in IPA and in the heart of the researcher of this inquiry. It is epistemologically assumed that access to these meanings may be possible if researchers take, Conrad's (1987:11) words, "an insider" perspective. Creswell (1994:90) purports that occupying the position of "an insider", requires researchers to use their preconceptions, which, he asserts, would help them, make

sense of the individuals' personal worlds and the meaning they attribute to the same. This dual way of analysis or two-stage interpretation process, which is popularly referred to as double hermeneutic, is emphasised in IPA (Langdridge 2007:77). It is for this reason that the approach is used in this study, as it fits in well with the researcher's perception of the nature of truth (ontology) and how it may be explored (epistemology). The double hermeneutic emphasised in IPA is an accurate reflection of the dual role of the researcher of this study. In some instances, the researcher assumed the position of the participants, using the thoughts and beliefs they (researcher and participants) share in making interpretations (Landridge 2007:80). In other instances, the researcher ask critical questions of what participants say during interviews.

This design has enabled the researcher to interact with the research participants in order to explore their understanding of community members' attitudes toward the Human Rabies in the Vhembe district. This design also enabled the researcher to view the study findings in the context of the participants' world view.

3.3 RESEARCH SETTING, POPULATION, SAMPLING, DATA COLLECTION AND ANALYSIS

3.3.1 Research setting.

The study was conducted in purposively selected primary health clinics of the Vhembe district Municipality of the Limpopo Province. Vhembe district Municipality is located in the northern part of the Limpopo Province. It shares borders with Zimbabwe in the north, Botswana in the North-West and Mozambique in the South-East. The Limpopo River valley forms the border between the Vhembe district and its international neighbours. The district is divided into four (4) local Municipalities, namely, Mutale, Makhado, Musina and Thulamela. Health services are delivered by 1 Regional Hospital, 6 District Hospitals, 1 Specialised Psychiatric Hospital, 8 Community Health Centers, and 112 clinics.

Vhembe district Municipality was chosen because despite the availability of rabies vaccines and the law requesting that all dogs and cats to be vaccinated against rabies in South Africa, in general and in Vhembe District Municipality, in particular, people continue to die of rabies in the District Municipality. Vhembe District Municipality has

a high prevalence of the Human Rabies. Of the 46 case fatalities in the province of Limpopo due to rabies since 2001 to date, 44 are from Vhembe district. Community members with animal bites are treated at primary healthcare clinic level; only those with category 3 are referred to hospital to be managed by doctors. All professional nurses in all facilities have been trained on how to manage animal bites. Primary health care clinics will be the target sites of this study.

3.4.2 Population.

Parahoo (2014:218) defines population as “the total number of units from which data can be collected”, and this may include individuals, artefacts, events or organisations. Burns and Grove (2003:213) describe population as all the elements that meet the criteria for inclusion in a study. While Nardi (2014:113) defines population as the total collection of units or elements of a study, which in this case relates to community members of the Vhembe district Municipality. The population of the study consisted of male and female community members, age 18 years and above, who consult at the Primary Health Care facilities in the four selected Municipalities of Vhembe District.

3.4.2.1 Inclusion criteria.

- Male and female community members aged 18 years old and older who consult at the Primary Health Care facilities of Vhembe District.
- Community members who reside in either of the four selected Municipalities (Mutale or Makhado or Musina or Thulamela) of Vhembe District.
- Community members who are willing to take part in the study.

3.4.2.2 Exclusion criteria

- Male and female community members younger than 18 years' old who consult at the Primary Health Care facilities of Vhembe District.
- Community members who reside outside of Vhembe District.
- Community members who are not willing to take part in the study.

3.4.3 Sampling and sample size.

A sample is a part or fraction of a whole, or subset of a large set, selected by the researcher to participate in a research study (Polit & Beck 2012:279). In this study, purposive sampling technique was used to select the research participants as well as the Primary health care clinics within Vhembe district Municipality where there is a high prevalence of the Human Rabies.

Parahoo (1997:232) describes purposive sampling as “a method of sampling where the researcher deliberately chooses who to include in the study based on their ability to provide necessary data”. Primary health care clinics within the municipalities of Vhembe district with experience of rabies, including the Human Rabies were identified and purposively selected for participation in the study. Community members (males and females aged 18 years and above) who consult at the identified primary healthcare clinics with any health condition that may be linked to rabies (such as fever), and who were capable and willing of articulating their experiences were purposively sampled and recruited for participation in the study. The primary clinics recruited for participation in the study include: Nancefield clinic, Mahado health centre and Tswbinga clinic.

The sample size of the individual interviews and focus groups interviews of this IPA study were determined by the principle of data saturation. Data saturation is the point at which themes and categories in the emergent data become repetitive and redundant such that no new information relevant to the study's aims and objectives can be gleaned by further data collection (Polit & Beck 2012:62). In this study, data saturation was reached at the 20th individual interview and 6th focus group interview. However, the interviews continued until the 20th research participant. This means that the sample size for the individual interviews was 20 participants ($n=20$), and the sample size focus groups was 6 consisting of 6 community members each ($n=6 \times 6$).

3.4.4. Data collection instruments.

The data collection instruments of this study were the researcher and the interview schedules. Two interview schedules were developed, one for the focus group interviews and the other for the individual interviews (See appendixes 1 and 2). The interview schedules used in this study were developed using the relevant literature

related to rabies, opinions of expert of the subject studied and the researcher's clinical experience. The interview schedules developed were subjected to a preliminary investigation (pilot) on participants similar to the study's sample. The feedback obtained from the pilot led to the revision of the interview schedules, which were subsequently used in the main study as data collection tools or instruments. As mentioned earlier, the researcher of this study was a data collection tool; she was the primary tool for data collection, as she engaged with the participants to elicit information from them.

3.4.5 Data collection.

Data were collected by means of semi-structured interview format. The semi-structured interviews were conducted on individual participants and focus groups. Data were collected during May and August 2017. Data collection commenced with individual interviews followed by focus group interviews. The rationale for adopting this sequence of data collection was to enhance insight into the phenomenon of the Human Rabies. Issues not adequately addressed in the individual interviews were clarified and discussed in the focus group interviews. The semi-structured interview format adopted in both sets of interviews (individual and focus groups) were guided by their respective interview schedules. All interviews, individual and focus groups, were audio-recorded and each of the interviews lasted for about 45 to 60 minutes.

3.4.6 Data analysis.

According to Polit and Beck (2014:381), the purpose of data analysis, regardless of the type of data or the underlying research tradition, is to organize, provide structure and elicit meaning from research data.

The audio-recorded data collected at the individual and focus group interviews were transcribed verbatim and analysed manually using the principles of Interpretative Phenomenological Analysis framework (Smith, Flowers & Larkin 2009:96). This analytical framework has six steps, which are described below in the sequence they were applied to each of the transcripts of the study (see Figure 3.1).

Step 1: reading and re-reading. This step requires the researcher to read the transcripts several times to familiarize with the participants' stories. The researcher read each transcript twice and this enabled her to gain an understanding of the community members' views of the Human Rabies.

Step 2: initial noting. This step requires the researcher to make notes of interesting issues about the participants' stories. Here the researcher maintained an open mind and noted issues that captured her interest when reading the transcript, the second time. The researcher's familiarity with the content of the transcript grew as she was making notes. In other words, the researcher's understanding of how the participants talked, understood and thought about the Human Rabies grew when reading through the transcripts.

Step 3: developing emergent themes. This step requires the researcher to develop themes that reflect the meaning of the participants' accounts. The researcher critically examined the transcript, including the notes made, and developed the themes. This step of the analytical process is therefore inductive.

Step 4: searching for connections across emergent themes. This step requires the researcher to examine the themes and identify associations or connections among them. Thus, the similarities and differences between the themes were examined by the researcher and she grouped or clustered the themes that were similar. The frequency with which an emergent theme appeared was also observed by the researcher as it indicated its relative importance and relevance to the participant. Each of the cluster of themes was given a name that captures the meaning of its components. The generic name given to each of the clusters of themes in the context of IPA was "super-ordinate theme" (Smith, Flowers & Larkin 2009:96).

Step 5: development of a master table of themes. This is the stage the researcher is required to put together the emergent themes from a single transcript, including keywords or phrases and page numbers to indicate where in the transcript the themes can be located. The researcher developed a master table for each transcript.

Step 6: development of a single master table of themes. This is the stage the researcher is required to develop a single master table of themes for each of the set of interviews, individual and focus group interviews. Here the researcher closely

examined the master tables of each of the transcripts of the individual interviews and combined the data contained in the same into a single master table of themes. The researcher did the same for the transcript of the focus group interviews. The outcome of this exercise was two single master tables; one for the individual interviews, and the other for the focus group interviews. These single master tables were combined and presented as a single table in the next chapter given their similarities. The single master table set the scene for discussion in the discussion chapter.

Step 1: reading and re-reading



Step 2: initial noting



Step 3: developing emergent themes



Step 4: searching for connection across emergent themes



Step 5: development of a master table of themes.



Step 6: development of a single master table of themes.

Fig. 3.1: Steps of IPA framework of analysis (Smith, Flowers & Larkin 2009).

3.5 ETHICAL CONSIDERATIONS OF THE STUDY.

Research studies need to be conducted in an ethically sound manner in order to safeguard the rights of participants (Lisa et al. 2008: 896-897). Given this, the researcher of this study adhered to key ethical principles, which are discussed below.

- Informed consent

The participants in this study were fully informed about the aim of the study and its procedures. They were also informed about the benefits of the study, and the role they were required to play. This was to ensure that they understood the nature of the study before agreeing to participate in the same. All of the participants understood the nature of the study and expressed their willingness for participation by signing the consent form.

- Voluntary participation

The researcher informed the participants that their participation in the study was voluntary, and that they had the right to withdraw from the study at any time without providing reasons. The participants were informed about this right before the commencement of the interviews. Added to this, they were informed that they had the right to terminate their participation should they experience any physical or psychological distress during the interviews.

- Confidentiality and participants' rights to autonomy

The researcher ensured that all the information the participants provided during the course of the study were treated with the strictest confidence. Added to this, all the hard copy study data was kept in a safe locked cupboard at the researcher's work place, and only accessible to the researcher. The soft copy data on the researcher's computer were password protected, and only the researcher knew the password. The researcher ensured that Information that was obtained in connection with the study that could be identified with the participants was kept confidential and would be disclosed only with the participants' permission or if required by law. However, some aspects of the study might be published or presented at conferences, but identifiable information of participants would be omitted.

- Participants' right to self-determination

The participants were informed of their right to self-determination. The researcher informed them that they could express themselves freely and it would not have any negative impact on them.

- Participants' rights to privacy

The researcher assured the participants that the research report would not be presented in such a manner that would reveal identifiable participants' behaviour and responses. For that reason, the interviews were conducted in a private venue at one selected primary healthcare clinic in Vhembe District Municipality. The rationale for this was to ensure privacy and confidentiality of the participants' information.

- Participants' rights to fair treatment

The researcher ensured that all participants who met the inclusion criteria took part in the study and no participant was excluded from taking part in the study on the basis of his origin, race or colour, ethnicity, socioeconomic status, culture, language, sexual orientation and disability. All participants were treated equally during the interviews.

- Avoidance of harm

The participants were protected from all sort of harm during the study. No participant was noted during and after the interviews to complain or experience physical and/or psychological harm.

3.6 TRUSTWORTHINESS OF THE STUDY.

Lisa et al. (2008: 896-897) state that the trustworthiness of qualitative research can be viewed as the ways in which qualitative researchers ensure that transferability, credibility, dependability and confirmability are evident in their research studies. Trustworthiness provides qualitative researchers with a set of tools with which they can illustrate the value of their research.

According to Andrew (2004:64), Guba and Lincoln (1994:36) proposed five criteria that they believed should be considered by qualitative researchers in pursuit of a trustworthy study. These criteria, which include credibility, dependability, confirmability, transferability and authenticity, correspond to the hallmark of quality (validity, reliability and objectivity) used in quantitative research. These similarities are illustrated below.

- Credibility corresponds to internal validity in quantitative research.
- Transferability corresponds to external validity in quantitative research.

- Dependability corresponds to reliability in quantitative research.
- Confirmability corresponds to objectivity in quantitative research.

To ensure the trustworthiness of this study, the researcher ensured adherence to the Guba and Lincoln's (1994:36) criteria.

3.6.1 Credibility.

Credibility refers to the correctness and truthfulness of the data and the information supplied by the participants (Guba & Lincoln 1994:36). The researcher ensured credibility by the use of an interview schedule, audio-recording interviews, note taking during interviews, member checking, validity checking, reflective engagement (reflexivity) after each interview, verbatim transcription and the provision of a thick and rich research report. Added to this, the researcher illustrated in the research report the congruency and differences of the research findings and the extant literature relevant to the study.

3.6.2 Transferability.

Transferability refers to the degree to which the results and findings of a study can be applied to other similar contexts or settings (Guba & Lincoln 1994:37). This was ensured in this study through the provision of a detailed research report that contains the stages of the research process and excerpts from the participants' narratives. The context of the research is also fully described in the report. The rationale for this is to enable readers to interpret and understand the findings in relation to the context in which the study was conducted.

3.6.3 Dependability.

Dependability refers to the consistency and stability of the findings of a study (Guba & Lincoln 1994:37). The researcher established the dependability of this study by developing and utilising interview schedules, and subjecting the same to a preliminary investigation (piloting). Dependability was further ensured by member checking, the use of a co-coder, audio-recording the interviews, verbatim transcription, audit trail and

the provision of a detailed research report that includes experiences and personal stories of the participants in relation to the study.

3.6.4 Conformability.

Conformability refers to the degree to which the results and findings of a study can be confirmed by others (Guba & Lincoln 1994:37). This was ensured in this study through the use of a co-coder, and member checking. In relation to the latter, the researcher took some transcripts to a few participants to clarify whether aspects of the transcripts were a true reflection of the stories they narrated.

3.7 CONCLUSION.

This chapter has offered discussions of the methodology utilised in the study, which includes the research design and methods of data collection and analysis. The chapter also provided discussions of ethical considerations and how quality (trustworthiness) was ensured. The next chapter focuses on the study findings.

CHAPTER 4

PRESENTATION OF RESEARCH FINDINGS.

4.1 INTRODUCTION.

This Chapter presents the findings of the study, which, in essence, include the attitudes of community members toward the prevention, control and management of the Human Rabies in Vhembe district of Limpopo Province in South Africa. Three superordinate themes were revealed from the data analysis. Each of the superordinate themes consists of sub-thematic categories. Excerpts of participants of both individual and focus group interviews, indicated in italics, are used in this chapter to substantiate the themes generated. At the end of each excerpt is either the initial 'FG' or 'IN', which stands for focus group or individual interviews respectively. The rationale for using the initials is to indicate the source of the excerpts. The initials are followed by two numbers, for example, (4,2) with '4' indicating the number of either the focus group interview or individual interview, and '2' indicating the page number of the transcript from which the excerpt was taken.

4.2 RESEARCH FINDINGS.

The intention of the researcher of this study is to develop an understanding of the attitudes of community members toward the Human Rabies. The intention of the researcher was also to develop a conceptual model for enhancing adherence to prevention and care approaches in Vhembe district of the Limpopo Province in South Africa. The findings of the study are presented in this chapter in line with the researcher's intentions.

4.2.1 Overview of the superordinate themes and sub-themes.

This section presents the study findings that emerged from the data sources of individual and focus group interviews conducted in the five health clinics (Nancefield, Malamulele, Mphambo, Tshwinga and Makhado) in Vhembe district, Limpopo Province. Similar themes were generated from the data of both the focus group and individual interviews. Thus, an overview of the study findings is presented in a single table (Table 4.1). However, differences in relation to the depth and breadth of discussions of some of the themes were apparent. In essence, the narratives of the

focus group interviews were much more discursive than those of the individual interviews. Three superordinate themes emerged from data analysis. Each of the superordinate theme has two sub-themes which are further divided into three sub-thematic categories each. The relationships among the superordinate themes and their respective sub-themes are depicted in Table 4.1. The superordinate themes and sub-themes are discussed below in the order in which they emerged during data analysis.

Table 4.1 Superordinate themes and sub-themes of individual and focus group interviews.

Superordinate theme	Sub-themes
Attitudes toward the Human Rabies	Positive attitudes <ul style="list-style-type: none"> • Seek medical help • Reporting of untoward incidents • Expressed willingness for vaccination
	Negative attitudes <ul style="list-style-type: none"> • We don't need pets • Stray animals deserve death • Don't bother- no cure
Factors influencing attitudes toward the Human Rabies	Internally motivated factors <ul style="list-style-type: none"> • Emotional states • Knowledge and skills • Feelings about healthcare services
	Externally motivated factors <ul style="list-style-type: none"> • Cultural beliefs • Accessibility of health clinics • Legal issues
Tackling the Human Rabies	Prevention strategies <ul style="list-style-type: none"> • Vaccination • Training and education • Increasing and improving healthcare services
	Control and management strategies <ul style="list-style-type: none"> • Law enforcement • Perceptions of prevention and care approaches • Role of traditional leaders

4.2.2 Attitudes toward the Human Rabies

This superordinate theme relates to the attitudes of community members in Vhembe district toward the Human Rabies. Community members are noted to have positive and negative attitudes toward the Human rabies. These attitudes are further divided into three sub-thematic categories. These sub-themes are presented as they emerged during the analysis of the focus group and individual interviews.

4.2.2.1 Positive attitudes toward the Human Rabies

This theme is divided into three sub-themes. They relate to the Vhembe district community members' willingness to seek medical help and vaccination for the Human Rabies treatment and report untoward incidents to authorities.

4.2.2.2.1.1 Seek medical help

Community members in Vhembe district were noted to express willingness to visit a clinic for medical help especially after an untoward incident involving animal bite. Willingness to seek medical help is defined as the tendency for community members to access rabies treatment services. In both the focus group and individual interviews, the majority of participants asserted that they will seek medical help for the Human Rabies disease.

My brother died from having been bitten by a dog. I will encourage anyone bitten by any animal to go straight to the hospital for help (FG:1,2).

This same perception was expressed by most participants in individual interviews when asked what to do when a dog bites a person:

If any of my relatives or friend is bitten by a dog, I will bring that person to the clinic for treatment of rabies (IN:2,1).

A dog bit my child and I took her to the clinic. She was treated for rabies (IN:1,1).

4.2.2.2.1.2 Reporting of untoward incidents

The participants in both focus group and individual interviews were assertive in reporting dog or any other animal bite incidents either to the police or clinic or traditional leader.

I will report a dog bite incident to the police for the dog owner to do something. He must explain if the dog was vaccinated. Dog owners fail to vaccinate their pets as stipulated by law (FG:1,3).

I was bitten by a dog not infested with the rabies virus but I reported to the police for the dog owner to be arrested. I then went to a clinic for treatment of the wound. I will advise any victim of animal bite to report to the nearest clinic and/or police station (IN:2,1).

4.2.2.2.1.3 Expressed willingness for vaccination

It was noted in both the individual and focus group interviews that the majority of participants want all pets to be vaccinated.

I think if you can vaccinate people and dogs against rabies so that even if they are bitten they do not fall sick. The pet owners must ensure regular vaccination so that our community will not have the rabies virus especially reservoir hosts such as domestic dogs and cats (FG:2,3).

Owners of dogs must keep their dogs safe by building fences and make sure their dogs are vaccinated regularly. However, the vaccines for animals should be free of charge and made available at all times (FG:3,4)

Similar sentiments were expressed by participants when asked what they think the municipality should do to tackle the problem of rabies.

The municipality should provide vaccines for all dogs and cats. Community members owning animals should be encouraged to vaccinate their animals against rabies (IN:7,3)

The municipality should conduct house to house inspection and make sure proper vaccination is given to all dogs to prevent rabies. The municipality must educate villagers about the importance of vaccination (IN:3,3)

The responsibility of vaccinating pets regularly by their owners seems to be a problem in tackling the Human Rabies in Vhembe district.

4.2.2.2 Negative attitudes toward the Human Rabies

This theme is divided into three sub-thematic categories. They relate to ownership of pets by community members in Vhembe district, and the fact that there is no cure for the Human Rabies disease.

4.2.2.2.1 We don't need pets

Some participants were of the view that villagers should not own dogs and cats as pets. Few participants expressed the same view during individual and focus group interviews.

I think the municipality should not allow people to own cats or dogs as pets. Alternatively, pet ownership license should be very expensive so that poor people will be unable to take care of pets. That way, there will be no stray animals to spread the Human Rabies disease (FG:5,4).

The municipality must put a ban on pet ownership in the villages especially for community members who fail to regularly vaccinate their pets (IN:19,2).

Most of the participants highlighted too many stray dogs as a problem in tackling the Human Rabies in their community in the Vhembe district.

4.2.2.2.2 Stray animals deserve death

The need to cull all stray animals in villages in Vhembe district was highlighted by participants during individual and focus group interviews as a strategy to control the Human Rabies.

The municipality should kill all stray dogs to keep the community free from the Human Rabies. Stray dogs are mad and can bite anyone so they deserve to die (FG:2,6).

We have too many stray dogs in our village. The owners failed to vaccinate them and they transmit the rabies virus. Therefore, they must be killed to prevent the spread of the Human Rabies (IN:14,5)

4.2.2.2.3 Don't bother- no cure

A very few participants were of the view that they do not care about the Human Rabies because there is no cure for the disease.

As far as I am concerned I don't care. The disease is caused by witch craft through dogs and there is no cure unless you go to a traditional healer (FG:1,3).

As far as we know, the Human Rabies disease has no cure like HIVAIDS. We cannot do anything to cure or prevent it. Therefore, the municipality should do something to stop the spread of the rabies virus (IN:13,3).

The above attitudes toward the Human Rabies were found to be influenced by certain factors that were either internally or externally motivated.

4.2.3 Factors influencing attitudes toward the Human Rabies

The discussions on the participants' experience and perception of the Human Rabies enabled participants to share their personal experiences during both focus group and individual interviews. This superordinate theme focuses on the factors that may influence the Vhembe community members' attitudes toward the Human Rabies. Community members are noted to share internally and externally motivated factors influencing their attitudes toward the Human rabies. These factors are further divided into three sub-thematic categories.

4.2.3.1 Internally motivated factors

This theme is divided into three sub-thematic categories. They relate to the internal factors influencing community members' attitudes toward the Human Rabies in Vhembe district.

4.2.3.1.1 Emotional states

It was apparent in both individual and focus group interviews that some participants were very emotional about the incidences of the Human Rabies disease in Vhembe district municipality. Some participants displayed strong emotions when sharing their personal frustrations of losing family members to rabies because of ignorance, which motivated them to seek for information about the Human Rabies disease.

My brother died from having been bitten by a dog. He did not go to the clinic for help. He started behaving as if he was confused. We never thought the confusion was related to the dog bite until we took him to the clinic. At the hospital they asked if he was ever bitten by a dog and we all said yes. I was after the loss of my brother that I learnt that dog bites can cause the Human Rabies (FG:2,4).

Hmm (deep breath) My brother was normal after having been bitten, after some days he started being furious for no reason, he locked his wife and children outside the house, then we realized that something was not right. He deteriorated while he was in hospital. He started to behave like a dog, and bark like a dog while in hospital. He was mentally confused. He stayed for the whole month with no signs at home. The bite resulted in a small wound; you would not think of anything. My brother lost his mind, he could not even recognize us. The disease is dangerous from what I was told in the clinic (IN:1,4).

Apart from the emotional status, community members' knowledge and skills might influence their attitudes toward this disease.

4.2.3.1.2 Knowledge and skills

When asked what to do to someone bitten by a dog, the most popular view expressed by participants was that the victim must be taken to the clinic. However, some participants were of the opinion that the wound should be treated at home before going to the clinic. This however depends on the size of the wound.

I will go to the clinic, but if the bite is small I will not go to the clinic, it will heal on its own (FG:4,2).

All I know is that if the wound is small, you should wash it with methylated spirit or salt water and you will be ok. So, there is no need to go to the clinic (IN:18,3).

When the issue of wound size was explored further, some participants asserted that when a person is bitten by a rabid animal, the first step is to go to a hospital for medical attention.

Even if the wound is small you must go to the clinic when bitten by a dog that is infected with the rabies virus (IN:17,3).

In general, the majority of the participants were noted to have little or no knowledge about the Human Rabies, including the signs and symptoms.

I have never heard of someone suffering or who died of the Human Rabies. We do not have information on the disease. People must be educated about the disease and its dangers. Teach them in the community about the dangers of rabies, and then they will take it seriously. Otherwise there is no any other way (FG:2,2).

I don't know anything about the Human Rabies. I cannot tell you the signs and symptoms of a human being or a dog suffering from rabies. Lack of knowledge can prevent us from coming to the clinic especially when the dog bite wound is small and we can treat it with methylated spirit (NI:1,2).

Related to lack of knowledge is unhappiness about service delivery, which seems to be influencing community members' attitude towards the Human Rabies.

4.2.3.1.3 Feelings about healthcare services

Participants were generally not happy about the healthcare services the clinics were offering them. According to the participants, the dissatisfaction was mainly centred around shortage of medicines and long waiting times, which in essence, discouraged them from accessing treatment for rabies at the clinics.

I think that even if you go to the clinic you will not find medication. Many a times when we come here they tell us that there are no medications. Last time I came here, they told me they don't have medicine to heal my sickness and the Nurses are available, but there was no medication. So, there is no point to come here (FG:3,5).

We arrived here early in the morning and still we are waiting to be seen, you can sit here for the whole day meanwhile you are in pain.

Nurses just move around and do nothing instead of seeing us (FG:7,2).

Shortage of medicine at the clinic, it is discouraging when you go to the clinic and you are told that there is no medicine (IN:11,2).

We arrived here early in the morning and still we are waiting to be seen; we can sit here for the whole day. Nurses just move about doing nothing; they should attend to us (IN:6,2).

The biggest problem is that we sit for a long time at the clinic whilst we are in pain. Last time when I came here I left the clinic at night. What would one have done if one did not have a transport? (IN:8,4).

In addition to the above mentioned internally motivated factors, some externally motivated factors were noted to impact community members' attitudes toward the Human Rabies.

4.2.3.2 Externally motivated factors

This theme is divided into three sub-themes. They relate to extrinsic factors influencing community members' attitudes toward the Human Rabies in the Vhembe district in Limpopo Province. They include community members' cultural beliefs, accessibility of health clinics and legal issues.

4.2.3.2.1 Cultural beliefs

Most participants of the focus group interviews claimed that any disease associated with behaviours such as confusion, which might ultimately lead to death, should be rightly associated with witchcraft.

Rabies is disease associated with bewitched people in our culture. It happens when a person is bitten by a dog and that person changes his behaviour as if he is mixed up mentally. I agree, rabies is a witchcraft disease where they send animals to you, especially dogs, through witchcraft spells in your dreams. Only to find out that a dog will bite or scratch you in real life and if you do not go to traditional healer you will become mad and die eventually (FG:1,3).

A similar support for the explanation of witchcraft's crucial role in the causation of rabies was also noted in the individual interviews.

You know what, they use these animals to bewitch you. People are witches; they can fly at night to bewitch others by putting rabies in their bodies (IN:14,20).

Two people in our village were bewitched and they died after being bitten by a dog even though they were treated at the clinic (IN:16, 4).

Even though the association of the Human Rabies to witchcraft was evidently talked about by most participants of the individual and focus group interviews, a few participants were of the view that witchcraft has no role to play in the transmission of the rabies virus from animals to humans. Participants with the later view therefore stressed that victims of dog bites should always seek medical help immediately in clinics.

I will go to the clinic as soon as I get bitten by a dog or cat to seek medical help because I cannot tell if the dog is infected with the rabies virus (FG:6,3).

If I am bitten by a dog, I will go straight to the nearest clinic for medical help (IN:17,3).

However, participants highlighted that going for medical help at clinics, sometimes, can be a challenge in their respective communities.

4.2.3.2.2 Accessibility of health clinics

The majority of the participants indicated that they had difficulties in accessing medical assistance as the clinics were situated far away from their respective communities. A participant during focus group interviews made a good attempt to articulate this perception:

If I am staying far from the clinic it is difficult to visit, as I sometimes don't have money for transportation (taxi) to do so (FG:5,4).

Apart from the distance to the clinics, participants stressed that the number of injections prescribed as treatment are many. Most participants stated that they often did not comply to the treatment because of their financial problems.

People bitten by dogs complain that the injections are too many and they don't have money for transport to complete the dosage. Clinics are far away from our village, and it makes people not to go for their appointments (FG:2,4).

Currently, I am not working, to come to the clinic for many injections is a challenge for me. I might not manage to come due to lack of transport. I am staying far away from the clinic so I might come maybe only for three days as I do not have adequate funds. I will not be able to complete the treatment (IN:10,3).

In general, poverty, social status and lack of resources, were identified as external factors influencing community members' accessibility to the clinics for the Human Rabies.

4.2.3.2.3 Legal issues

Some participants asserted during both sets of interviews that pet owners should control their pets to prevent them from biting others, which in this case relates to humans and other animals. They added that the pet owners should ensure that their pets are regularly vaccinated against diseases such as rabies.

Conduct campaigns in rural communities. Develop a law that prohibit people to have a dog if they do not have a secure fence and if they are unable to vaccinate them regularly (FG:3,2).

The animals should be placed in a fence, and the municipality must enforce this. In this way, the animals, including dogs, will be prevented from roaming the streets and biting people (IN:13,2).

Participants were consistent with the view that the municipalities should do more to prevent the incidence of rabies in their respective communities. Participants therefore suggested for all domestic animals to be registered, licensed and vaccinated.

Municipalities must issue licences to owners for their pets and also ensure that the pets especially the domestic dogs are vaccinated regularly (FG:4,2).

Yes, I agree that dog owners must control their pets and ensure regular vaccination of them. This is what the municipality must do through the help of the law enforcement agencies (IN:12,2).

According to participants, the control measures (license and enforced vaccinations) will not only influence community members' attitudes, but they will also contribute to the prevention, control and management of the Human Rabies disease.

4.2.4 Tackling the Human Rabies

This superordinate theme relates to the prevention and management approaches for the Human Rabies. It has three sub-thematic categories that are discussed below.

4.2.4.1 Prevention strategies

4.2.4.1.1 Vaccination

Vaccination of humans and animals (domestic dogs and cats), especially the latter, was considered by participants the best strategy to control and manage the rabies virus.

There are many stray dogs in our village where we are staying. The municipality workers must ensure house-to-house visits to inject or vaccinate the dogs. All dogs must be vaccinated. You know, children are vaccinated against several diseases and the same should be done for dog puppies (FG:14,3).

Veterinarians use to visit families with dogs to give them injection. The municipality must do a door-to-door campaign to inject the dogs. This is the best way to control and manage this disease (FG:20,2).

The importance of vaccinating dogs and cats was frequently mentioned in both individual and focus group interviews. Participants stressed the need for municipalities in Vhembe district to enforce dog vaccination laws if they want to succeed in controlling and managing the rabies virus.

The municipality must inject all dogs. It's just that people don't care to take their dogs for injection. People should be forced to take their dogs for injection (vaccination) according to the law. The police should arrest dog owners who do not comply with the laws (FG:3,2).

The municipality should go to all the villages and inform dog owners to bring their dogs for injection (IN:9,2).

Participants were of the view that people should also be vaccinated. The rationale here, participants stressed, is to prevent or at least reduce the incidence of the Human Rabies in the communities.

I think if you can vaccinate people against rabies so that even if they are bitten by a rabid dog they do not fall sick (IN:3,4).

To promote compliance with vaccination, participants claimed that community members need to be educated or made to be more aware of the rabies virus, especially its signs and symptoms, and preventive, control and management approaches.

4.2.4.1.2 Training and education

Some participants communicated a shared opinion about the importance of the municipality to embark on awareness campaigns to educate community members about the Human Rabies. They believed that lack of information does have a significant influence on community members' attitudes toward the prevention, control and management of the disease.

Teach us about the Human Rabies so that we know about its symptoms. The problem is that they only teach the staff at the clinics. They must also teach people in their local communities. This is because not everyone comes to the clinic. Further, community members must be trained how to care for dog bite victims especially where there are no clinics closer to the village (FG:5,3).

We do not have information about the sickness. People must be educated about the disease and dangers. Teach the community about the dangers of rabies over the radio and in schools and community meetings, and then they will take it seriously. Otherwise there is no any other way (IN:4,1).

Most of the participants expressed concerns about the difficulty with identifying an animal like a dog that is infected with the rabies virus. However, only few participants claimed that they could tell when an animal, for example, a dog is infected with the rabies virus.

For dogs, they often become aggressive and bite people randomly. Ammh, their tongues also protrude and salivate excessively (IN:4,5).

Participants therefore continued to emphasize the need to promote training and education campaigns in schools, churches, community meetings with traditional leaders in attendance, and on the radio. What is also needed, participants emphasised, is the need to train community health workers in how to vaccinate, as doing so would increase coverage of vaccination that in turn would lead to a reduction in the incidence of the Human Rabies.

Train the community health workers to inject because they are always there in the community. Train at least one community health worker in each village (IN:81,3).

4.2.4.1.3 Increasing and improving healthcare services

Although some of the participants were satisfied with the current service delivery for controlling and managing the Human Rabies disease, a good number were of the opinion that services need to be increased and improved to encourage community members to visits for treatment.

Mobile clinics do visit our villages every day, they only visit bi-weekly, maybe if they can visit the communities every day, more dogs would be vaccinated, and more people would be educated about the Human Rabies, and rabies in general (FG:10,2).

More clinics are needed and the frequency of mobile clinics visits to remote villages should be increased (IN:5,4).

It was noted that community members feel the police and traditional leaders must be involved in the control and management of the Human Rabies in Vhembe district.

4.2.4.2 Control and management strategies

4.2.4.2.1 Law enforcement

It was noted in both the individual and focus group interviews that the majority of participants wanted pet ownership laws to be strengthened and enforced to promote the control and management of the Human Rabies in Vhembe district.

The municipality must inject all dogs. It's just that people don't care to take their dogs for injection. Those people should be arrested by the police and taken to court to be fined or punished. In that way, people will learn to obey the law (FG:3,4).

The municipality and police should go to villages and inform dog owners to bring their dogs for injection. People should be forced to take their dogs for vaccination. Those who refuse to do so should be arrested and they should face the full might of the law, including imprisonment (IN:14,2).

4.2.4.2.2 Perceptions of prevention and care approaches

Some participants associated pain with the treatments of rabies, especially the intramuscular injections. They reported that pain might prevent community members from visiting clinics after a dog bite, and subsequently transmit the virus to another human and die.

Another thing we fear is needle (injection), it is very painful and too many. We know that when you go to the clinic they will inject you and that can make us stay at home. It will help if they can reduce the number of painful injections or find a cure (FG:1,3).

Despite the concerns of pain expressed, some participants indicated that they would take a person bitten by a dog to the clinic after treating the wound with salt water or

methyated spirit. These participants were of the view that any individual bitten by a rabid animal (e.g. a dog) should go to the clinic for medical treatment even if the individual in question has been offered the traditional remedy of salt water and methyated spirit.

If you clean the wound with salt and magazine (potassium chloride) the wound will heal on its own. But the person still needs to go to the clinic (IN:16,3).

4.2.4.2.3 Role of traditional leaders

According to the participants' perspective, traditional leaders play a key role in influencing attitudes of members in rural communities, especially if cultural beliefs are associated with a disease.

Involve our traditional leaders to teach us about rabies so that we can know. The problem is that they only teach at the clinics. Don't teach at the clinic only; go and teach out there where people stay because not everyone comes to the clinic. Go to village meetings with traditional leaders in attendance then people will take the disease seriously (FG:17,6).

I will bring that person to the clinic. There is no traditional medicine if there was in our village, I would take him/her to the traditional healer (IN:3,4).

Taken together, according to the individual and focus group interview discussions held with the participants, several themes emerged that relates to attitudes toward the Human Rabies and approaches for the control, prevention and management of the disease. In addition, detailed descriptive extracts from the transcripts of both interviews (individual and focus group) illustrating views of the participants were presented. However, it was clear that there is a need for enhancing community members' adherence to the prevention and care approaches in Vhembe district in Limpopo Province.

4.3 Development of a conceptual model for enhancing community members' adherence to the prevention and care approaches

In the previous section of this chapter, the participants shared several factors they perceived to influence community members' attitudes toward the Human Rabies. In addition, the participants shared perceived strategies to prevent, control and manage the Human Rabies disease in Vhembe district; however, the practice of vaccination and immunoglobilisation seem to be failing in the district as deaths due to rabies are still being reported. Based on the barriers identified during the study, the researcher developed an adherence to prevention and care approaches model. The purpose of the development of the conceptual model is to enhance community members' adherence to prevention and care approaches for the management of the Human Rabies in Vhembe district.

4.3.1 Conceptual Model Development

This section deals with the development of the conceptual model of this study using the extant literature reviewed, the researcher's practical experience and the opinions of experts in the field of rabies. There are several frameworks available for the development of conceptual models. Examples of these include Grounded Theory and Walker and Avant (2014:140) frameworks for conceptual model development. A closer examination of these frameworks resulted in the researcher opting for the walker and Avant (2014:140) framework because it allows researchers to consider a wide range of sources in formulating models. This framework has three approaches: analysis, synthesis and derivation. Each of these approaches has three strategies: concepts, statement and theory. Given the aims and objectives of this study, the researcher opted to use the synthesis approach which, as mentioned, has three interrelated strategies: concept synthesis, statement synthesis and theory synthesis. Each of these strategies are discussed below to illustrate the contribution in the conceptual development process.

4.3.1.1 Concepts synthesis

A concept is a mental image of a phenomenon; an idea or a construct in the mind of a thing or an action (Walker & Avant 2014:145). In this qualitative study, the phenomenon of interest was adherence to the prevention and care approaches for the management of the Human Rabies disease in Vhembe district. Using the Theory of Planned Behaviour approach, participants were interviewed through individual and

focus group interviews on the factors influencing their attitudes toward the Human Rabies. In the analysis of the data obtained, a concept synthesis approach (Walker & Avant 2014:145) was used to get new ideas about the phenomenon of interest. With the researcher's practical experience and extant literature, concepts were developed from scratch and the patterns and relationships between concepts were discovered during the analysis. The research was able to group together concepts with similarities and differences into thematic categories. Labels that accurately represents the phenomenon were given for these thematic categories to demonstrate their meaning in relation to the phenomenon of interest. In this present study, Vhembe community members were noted to share several factors that are influencing their adherence to the prevention and care of the Human Rabies disease. At the beginning of the concepts synthesis process, a system of classification was adopted by the researcher to combine two or more concepts that seem to relate closely or overlap with each other in terms their meaning and scope. This concept development process resulted in the formation of high-order concept categories (superordinate themes). For example, the first high-order concept/construct that emerged from the concept synthesis process relates to community members' attitudes toward the Human Rabies. The factors under this high-order construct includes the community members' emotional states, knowledge and skills about the Human Rabies and feelings about healthcare services in Vhembe district. These factors were noted to directly influence the community members' attitudes toward the Human Rabies, which in turn will influence their willingness to adhere to the Human Rabies prevention and care approaches in the district. Willingness to adhere to prevention and care approaches is defined as the tendency for community members to access the Human Rabies prevention and care services. Similarly, the system of classification was continuously used in the concept development process to generate other constructs. The second construct to emerge relates to the community members' knowledge and skills about the Human Rabies. The community members' knowledge and skills were noted to have a direct influence on their attitudes to the Human Rabies. Knowledge and skills refer to the level of awareness about the Human Rabies and how community members treat dog bitten victims. In this study, the level of awareness about the Human Rabies was found to be very low among the participants as majority were unable to describe the signs and symptoms of rabies in humans and dogs. Cultural beliefs among community members was also noted to influence the treatment for dog bite wounds. All these factors were

noted to influence community members' knowledge and skills, which seemed to have a direct effect on both their attitudes toward the Human Rabies and adherence to the prevention and care of the same. The continuation of the concept synthesis to saturation resulted in the formulation of five constructs that are either directly or indirectly related to the community members' adherence to the prevention and care approaches used in Vhembe district. The third construct that emerged relates to community members' personal experiences and accessibility of health clinics services. Community members shared personal experiences of losing loved family members due to ignorance about the dangers of the Human Rabies. The socioeconomics of community members was also noted to influence accessibility of health clinics services for the treatment of dog bites and adherence to complete the treatment (injections). The fourth construct relates to training and education. Community members were noted to express willingness to undergo training and acquire more knowledge about the Human Rabies with the understanding that they will take the disease more seriously. The fifth construct relates to community members' perception of the prevention and care approaches in Vhembe district. Community members were noted to express strong sentiments about the current prevention and care approaches that are influencing their attitudes toward the Human Rabies.

4.3.1.2 Statement synthesis

A statement in the context of theory synthesis establishes a link between concepts, and it can be either relational or nonrelational statement (Walker & Avant, 2014:155). A relational statement establishes a semblance of relationship between two or more concepts, and a nonrelational statement is a theatrical or operation definition or an existence comment that asserts the existence of the concept (Walker & Avant, 2014:155). According to Walter and Avant (2014:155), statement synthesis involves using logical operations based on evidence to establish specific relationships between two or more concepts to construct statements about a phenomenon of interest. In this qualitative study, the sources of evidence for the statement synthesis included the study findings, extant literature reviewed, the researcher's practical experience and the opinions of experts in the field. The researcher examined the study findings critically in order to validate emerging ideas and refine concepts and relationships in the formulation of statements. This process was done in phases. The first phase

involved the collection and analysis of empirical data obtained through the individual and focus group interviews to develop concept categories. This phase was followed by the concept formation and concept development phases as described by Walker and Avant (2014:156). The final phase was concept modification and integration in relation to the phenomenon of interest. The statement synthesis approach used in this study resulted in the formulation of five statements in relation to community members' adherence to prevention and care approaches in Vhembe district. For example, community members' attitudes toward the Human Rabies was found to directly influence adherence to prevention and care approaches to the Human Rabies disease. Invariably, community members' attitudes toward the Human Rabies was noted to be influenced directly by the knowledge and skills they possess and the kind of training and education they receive or are exposed to about the Human Rabies in the community. Awareness campaigns and training programmes that include traditional leaders can provide information materials that will enable community members to either develop positive attitudes to the Human Rabies that will in turn directly influence adherence to the prevention and care approaches or be fully informed (high level of awareness) with enhanced chances of directly seeking medical help, which will enhance their tendency to adhere to the prevention and care approaches. Secondly, the community member's personal experience and accessibility to health care services was found to have a direct influence on adherence to prevention and care approaches in Vhembe district. In addition, the community member's personal experience and accessibility to health care services were found to influence their attitudes toward the Human Rabies, which in turn will directly influence adherence to prevention and care approaches in Vhembe district. Community members' personal experiences encouraged them to develop positive attitudes to the control, prevention and management of the Human Rabies, which in turn will reinforce their tendency to adhere to the prevention and care approaches. Thirdly, the community members' perception of the prevention and care approaches was found to have an effect on their attitudes to the Human Rabies. Community members were noted to give reasons discouraging access to treatment for rabies at clinics, which include too many painful injections, shortage of medicines and long waiting times. These factors can directly influence community members' attitudes toward the Human Rabies, which in turn will directly influence adherence to prevention and care for the same.

4.3.1.3 Theory synthesis

The theory synthesis as defined by Walker and Avant (2014:167) was used in the final stage of the formulation of the conceptual model. For this qualitative study, the choice and sequence of synthesis approaches identified are concept synthesis, followed by statement synthesis and then theory synthesis, and was the procedure used to formulate a conceptual model for adherence to prevention and care approaches for the management of the Human Rabies. The choice of process of synthesis was to generate focal concepts from both the study findings and extant literature and examine their interrelatedness. A critical review of the extant literature together with the clinical experience of the researcher and expert opinions also played a part in the process. This process involved the identification and development of focal concepts and integrating them to form focal statements related to the phenomenon of the study. The focal concepts and statements were modified and integrated (as explained earlier) in the construction of a model using the theory synthesis approach. Using this approach, the researcher was able to pull together available information from the study findings and extant literature about the phenomenon of interest. The identified factors influencing community members' adherence to prevention and care approaches were organized into a network or conceptual model. These themes and their relationships are illustrated below in Figure 4.1, a conceptual model entitled, Adherence to Prevention and Care Approaches model. The conceptual model, as showed below is used to examine factors that contribute to Vhembe community members to adhere to the prevention and care approaches toward the management of the Human Rabies.

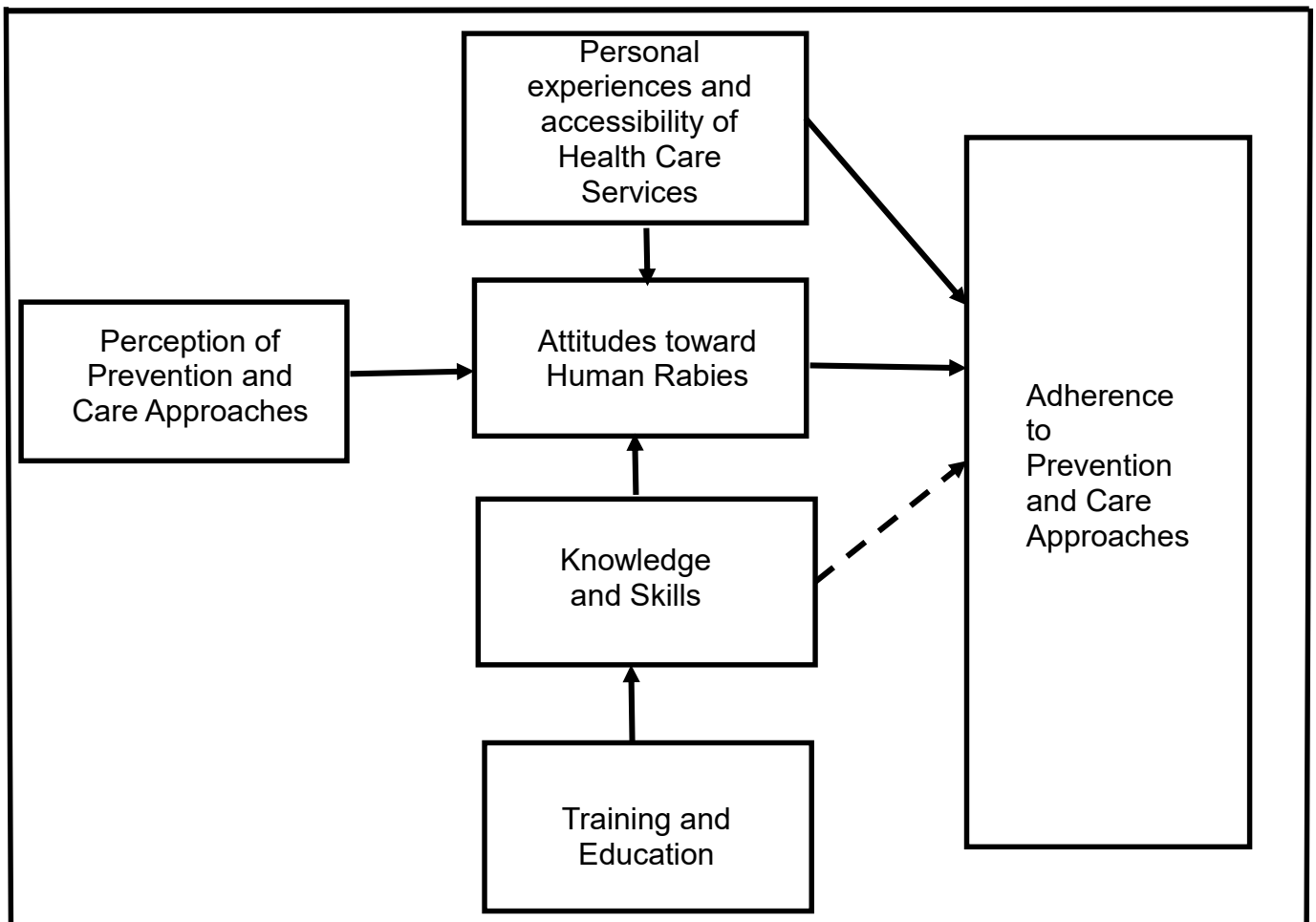


Figure 4.1: Adherence to Prevention and Care Approaches model.

4.3.2 The Structure of the Conceptual Model

The proposed conceptual model is composed of the following elements: concepts and statements and each of these elements is related to factors influencing community members' adherence to prevention and care approaches for the management of the Human Rabies. The conceptual model (Figure 4.1) is comprised of six components. These components include; personal experience and accessibility of health care services, attitudes toward the Human Rabies, knowledge and skills, training and education, perceptions of prevention and care approaches and adherence to prevention and care approaches. The relationships between these components and the direction of influence are represented by the directions of the arrows. For example, community members' attitude has a direct relationship with adherence to prevention and care approaches and at the same time it can be influenced by knowledge and skills of community members and their perceptions of prevention and care

approaches. Similarly, the community members' personal experiences and accessibility of health care services has a direct relationship with adherence to prevention and care approaches but it can also influence their attitudes toward the Human Rabies. According to this conceptual model, the interaction of these factors can influence community members' adherence to prevention and care approaches. The conceptual model indicates five factors as determinants of community members' adherence to prevention and care approaches for the management of the Human Rabies.

In sum, the developed conceptual model indicates that the adherence to prevention and care approaches construct is directly influenced by three main factors that includes community members' personal experiences and accessibility to health care services, knowledge and skills, and attitudes toward the Human Rabies. The community members' perception of the prevention and care approaches and training and education also have a direct and indirect influence on their attitudes to the Human Rabies respectively.

4.4. CONCLUSION

In this chapter, research findings were presented. Findings show that community members have both positive and negative attitudes toward the Human Rabies that were influenced by internal and external factors. Tackling the Human Rabies was found to require adopting proper prevention, control and management strategies. Adherence to prevention and care approaches for management of the Human Rabies was found to be influenced directly by three main factors and indirectly by two mediating constructs. An adherence to prevention and care approaches conceptual model for the community in Vhembe district in Limpopo Province has been outlined including its elements based on three approaches namely concept synthesis, statement synthesis and theory synthesis. The next chapter, which is the final one for this dissertation, provides the discussions of the study findings, recommendations, limitations and conclusion of the study.

CHAPTER 5

DISCUSSION, LIMITATIONS OF THE STUDY AND RECOMMENDATIONS

5.1 INTRODUCTION

The previous chapter presented the study findings. This chapter discusses the study's key findings regarding community members' attitudes toward the Human Rabies and the factors influencing their adherence of prevention and care approaches in Vhembe district. The chapter also discusses the limitations of the study and provides appropriate recommendations based on the study findings.

5.2 DISCUSSION OF THE STUDY FINDINGS

Discussion of the study findings is about interpretation and summary of the results and presentation of the findings relating to the extant literature. The discussion section connects the findings with similar studies (Brink, van der Walt & van Rensburg 2012:192). The discussion of the study findings covers the thematic categories and adherence to prevention and care approaches model, which were highlighted in the study findings section.

5.2.1 Attitudes toward the Human Rabies

To our knowledge there are only limited studies about community members' attitudes toward the Human Rabies in most countries in Africa, including in South Africa. The main goal of this study was to explore attitudes of community members toward the Human Rabies in Vhembe district of the Limpopo Province in South Africa.

In this study, an interpretative phenomenological analysis study design (IPA) (Smith 2005) was adopted for exploring community members' attitudes toward the Human Rabies. Individual and focus group interviews were conducted and the responses of participants were analyzed. Three superordinate themes emerged from data analysis. Each of the superordinate theme has two sub-themes which are further divided into three sub-thematic categories each. The community members' attitudes toward the Human Rabies emerged as one of the three superordinate themes and several factors were noted to relate to this theme. Broadly, these factors related to this theme include

positive and negative attitudes toward the Human Rabies that were influenced by several factors.

This study showed that majority of the community members have positive attitudes toward the Human Rabies in Vhembe district. It was noted during both individual and focus group interview discussions that most participants were willing to seek medical help following a dog bite incident. Further, they were noted to express willingness to report any untoward incidents and for vaccination of pets especially domestic dogs. Willingness to seek medical help is defined as the tendency for community members to access the Human Rabies prevention and care services, which might not necessarily translate into practice. For instance, in a recent study in Pétionville, an affluent suburb in the capital city of Haiti, 90% of respondents surveyed reported that they would seek medical care after an animal bite incident, however in practice, less than four out of ten individuals sought medical help after being bitten by a dog (Fenelon et al 2017:1634).

In our study, few participants shared negative attitudes toward the Human Rabies disease. This in essence relates to that fact the disease has no cure and therefore, people should not be bothered as nothing can be done to help victims. The lack of compliance with regular vaccination of pets by their owners was noted as a major problem and therefore, people should not own pets and all stray animals (domestic dogs in particular) should be culled in communities with rabies incidence reports in Vhembe district. In addition, a good number of participants expressed concerns about the difficulty with identifying a rabid animal like a dog that is infected with the rabies virus. However, only few participants claimed that they could tell when an animal, for example, a dog is infected with the rabies virus. This shared opinion by some participants was a clear indication of an educational deficit or low knowledge level of awareness about the disease because the disease is preventable and vaccines and immunoglobulins are available at clinics for the prevention and care of animal bites.

However, most of the participants in this study were in agreement with the view that if people are aware about the dangers of the diseases they will adopt positive attitudes toward promotion of the prevention, control and management of the Human Rabies. Interestingly, the majority of the participants knew that the rabies virus is transmitted through the bite of a rabid dog/cat but the disease is preventable by vaccination of

reservoir host such as the domestic dog. This finding is in line with those of Butler (1995:81) in a survey of communal land dogs in Zimbabwe, which showed high awareness among the respondents about the Human Rabies. In our study, knowledge of the Human Rabies, apparently was not noted as the main reason for the non-adherence to the prevention and care approaches in Vhembe district clinics. The majority of the participants were aware about the disease but yet human deaths of approximately 4 occur every year due to rabies in Vhembe district where our study was conducted. This study finding is in agreement with results obtained in a report on the knowledge, attitudes and practice about the Human Rabies in Haiti (Fenelon et al 2017:1634). Their results showed that the majority of the respondents (85.1%) knew about the disease but yet low healthcare-seeking behaviours were noted in their study. In a related study carried out in two towns in the Oshana Region of northern Namibia regarding the knowledge and awareness of rabies, the community members were noted to have high knowledge about rabies but gaps were identified that required extra awareness campaigns to clarify some educational issues (Haimbodi et al 2014:141-1). According to these authors, several factors were related to their observations including educational deficits. For example, few respondents were of the shared opinion that washing dog bite wound with soap or salt water, or methylated spirit can reduce the risk of rabies and that rabies is not fatal if post-exposure prophylaxis (PEP) is administered after the onset of signs and symptoms (Fenelon et al 2017:1634). Similarly, this knowledge gap or educational deficit and several other factors were noted in the present study that seemed to influence the Vhembe district community members' attitudes toward the Human Rabies.

5.2.2 Factors influencing attitudes toward the Human Rabies

This superordinate theme focuses on the factors that may influence the Vhembe community members' attitudes toward the Human Rabies. Community members are noted to share internally and externally motivated factors influencing their attitudes toward the Human Rabies. The most common internally motivated factors expressed by participants include community members' emotional states, their knowledge and skills and feelings about healthcare services in Vhembe district. The common extrinsic factors expressed include cultural beliefs, accessibility of health clinics and legal issues. In essence, community members' personal experiences and accessibility of

health care services coupled with their knowledge and skills emerged from the data analysis as factors directly influencing their attitudes to the Human Rabies disease. In general, the socioeconomics of community members was noted as a major factor influencing their attitudes toward the Human Rabies in the Vhembe district. For instance, because of too many painful injections in the prevention and care for the disease, and the associated financial burden involved in travelling long distances to clinics, most patients fail to comply with the treatments requirements resulting in them not completing full injection dosage. The reduction of the number of painful injections was perceived as a better treatment strategy because community members will reduce the cost and time involved in going to distanced clinics to complete the current treatment for the Human Rabies. This finding is in agreement with a study by Fenelon et al (2017:1634) showing that low educational status and high poverty levels among community members were important factors influencing the frequency and accessibility of dog rabies vaccination in Haiti.

In our study, another important factor that emerged to influence community members' attitudes toward the Human Rabies was their cultural beliefs about the disease. Most participants of the individual and focus group interviews claimed that any disease associated with behaviours such as confusion, which might ultimately lead to death, should be rightly associated with witchcraft. Cultural beliefs among community members was also noted to influence the treatment for dog bite wounds by washing with salt water or spirit. All these factors were noted to influence community members' knowledge and skills, which seemed to have a direct effect on both their attitudes toward the Human Rabies and adherence to the prevention and care of the same.

5.2.3 Tackling the Human Rabies

This theme was concerned about the exploration of participants' attitudes towards the current management process of rabies in the Vhembe district. The participants showed a positive attitude towards the promotion of the prevention, control and management of the Human Rabies. It was clear from the data sources, focus group and individual interviews, that adopting proper prevention strategies and embarking on improved control and management strategies were perceived as important in the prevention, control and management of the Human Rabies in Vhembe district.

According to the majority of the participants in this study, vaccination of humans and animals (domestic dogs and cats), especially the latter, was considered as the best strategy to control and manage the rabies virus. Participants were of the view that people should also be vaccinated. The rationale here, participants stressed, is to prevent or at least reduce the incidence of the Human Rabies in the communities. In addition, the participants stressed the need for municipalities in Vhembe district to enforce dog vaccination laws if they want to succeed in controlling and managing the rabies virus.

Regarding the control and management strategies to be adopted in Vhembe district, some participants communicated a shared opinion about the importance of the municipality to embark on awareness campaigns involving traditional leaders and schools' authorities to educate community members about the Human Rabies. They believed that lack of information does have a significant influence on community members' attitudes toward the prevention, control and management of the disease. Therefore, participants emphasized the need to promote training and education campaigns in schools, churches, community meetings with traditional leaders in attendance, and over the radio. What is also needed, participants emphasized, is the need to train community health workers in how to vaccinate, as doing so would increase coverage of vaccination that in turn would lead to a reduction in the incidence of the Human Rabies. In related studies in developing countries such as Haiti (Fenelon et al 2017:1634), Kenya (Mucheru, Kikui & Amwayi 2014:255), Zimbabwe (Butler 1995:81) and Namibia (Haimbodi et al 2014:141), literacy and education levels and lack of training of health care professionals for animal bite wound care are frequently encountered barriers that warrants engagement with communities through educational awareness campaigns about rabies to promote the control and management of the disease.

Related to the above factors is community members' perceptions of the prevention and care approaches to manage the Human Rabies that is currently implemented at clinics in Vhembe district. Although some of the participants were satisfied with the current service delivery at clinics, a good number were of the opinion that services need to be increased and improved to encourage community members to visits for treatment. For example, some participants were calling for increased mobile clinic

visits and availability of medications, and reduction in the number of painful intramuscular injections and waiting time at clinics.

In this study, most participants were of the view that rabid animals were the reservoirs of the rabies virus and that it can be transmitted to humans through animal bites or scratches, especially by the domestic dog. Also, they were aware that vaccination of pets was a necessary and important step in the control and prevention of the spread of the virus. However, some participants communicated a shared opinion that pet owners are not vaccinating their pets regularly as required by the law in the country even though the vaccines are freely available. It was noted that community members feel the police and traditional leaders must be involved in enforcing the law for the control and management of the Human Rabies in Vhembe district. In essence, the majority of participants wanted pet ownership laws to be strengthened and enforced to promote the control and management of the Human Rabies in Vhembe district.

According to this study findings, clearly, there is a need for enhancing community members' adherence to the prevention and care approaches, especially with respect to vaccination of humans and pets in Vhembe district in Limpopo Province.

5.2.4 Adherence to Prevention and Care Approaches model

In this study, the reason for developing a conceptual model was to examine factors that will contribute to the enhancement of community members' adherence to prevention and care approaches for the management of the Human Rabies in Vhembe district. In both focus group and individual interview discussions, most participants were of the view that the factors include community members' personal experience and accessibility to health care services, attitudes toward the Human Rabies, knowledge and skills, training and education, perceptions of prevention and care approaches and adherence to prevention and care approaches (as shown in Fig 4.1). Using these research findings together with the researcher's experience and extant literature, a synthesis approach (Walker and Avant 2014:140) was used to develop the conceptual model (Fig. 4.1). According to this conceptual model there are five factors that determine community members' adherence to the prevention and care approaches for management of the Human Rabies in Vhembe district. In essence,

three main factors namely community members' personal experiences and accessibility to health care services, knowledge and skills, and attitudes toward the Human Rabies can directly influence community members' adherence to prevention and care approaches for the management of the Human Rabies in the district. However, it is critical to highlight that high level of knowledge and skills about the Human Rabies do not necessarily have a direct influence on community members' adherence to prevention and care approaches for the management of rabies (the relationship is represented with broken arrows in Fig. 4.1) as other related studies have shown (Mucheru et al 2014:255; Haimbodi et al 2014:141; Fenelon et al 2017:1634). Since the outbreak of the Human Rabies in 2005–2006, which claimed the lives of 21 people, the Limpopo Province have experienced each year 1-4 rabies related human deaths caused by dog bites. Despite the implementation of surveillance systems and availability of free dog vaccines at clinics in the province, cases of the Human Rabies are still seen in Vhembe district, where dog rabies control and elimination measures have proven difficult (Department of Agriculture and Department of Health 2003:1). To address this untenable situation, the Adherence to Prevention and Care approaches model developed in this study proposes emphasis on positive attitudes toward the Human Rabies, which will have a direct influence on community members' adherence to dog vaccination. The attitudes can be enhanced by improved community members' perception of the prevention and care approaches through training and education.

5.3 LIMITATIONS OF THE STUDY

The study was conducted in a single district, Vhembe, excluding other districts in the Limpopo Province and it used a criterion purposive sampling approach to identify and recruit participants. Community members of this district may be different from those in other districts in the context of their experiences and attitudes toward the Human Rabies. Additionally, the findings of this study was based on retrospective accounts of experiences of rabies, and such accounts are usually subject to memory bias. They are also potentially subject to the social desirability effect, whereby participants might 'police' their responses in order to avoid negative judgments by researchers.

5.4 RECOMMENDATIONS OF THE STUDY

Based on findings of the study, the researcher made the following recommendations for the enhancement of the prevention, control and management of the Human Rabies disease in Vhembe district in Limpopo Province.

Firstly, according to the Adherence to Prevention and Care approaches conceptual model, there is need for more emphasis on encouraging community members to develop positive attitudes toward the Human Rabies disease.

Secondly, the model can be used in other districts with similar settings as a guide for improving the management and control of the Human Rabies in the Limpopo Province.

Finally, the Limpopo Department of Health needs to promote mass dog vaccination and increase the Human Rabies awareness campaigns in communities that will involve schools, traditional leaders and community radio programmes.

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APPENDICES

APPENDIX 1: Request for permission letter



MEMO

**TO: HEAD OF DEPARTMENT
LIMPOPO DEPARTMENT OF HEALTH**

FROM: MS NGOBENI MF

DATE: 23 JANUARY 2017

**RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT THE PHC
FACILITIES IN VHEMBE DISTRICT (I AM A REGISTERED STUDENT WITH
UNISA)**

Dear Dr Kgaphole

I am a registered student for Masters in Nursing, focusing on Public Health, in the University of South Africa– Department of Health studies. My student number is 6513174 and my research proposal to undertake the research would be submitted for ethical clearance to the Department of Health Studies Research Ethics Committee. The title of my proposed study is as follows:

Attitudes of community members toward the Human Rabies in the Vhembe district of the Limpopo Province, South Africa.

I am seeking permission to commence a research project in the health facilities as part of a Masters degree.

The proposed study intends to determine the attitudes of community members toward rabies. The outcome will assist Limpopo department of health to manage and to control human rabies as well as working towards elimination of the disease.

Part of the study involves community members' participation at interviews. With regards to this, your agreement to conduct the study is needed. It is therefore important for me to fully inform you of the study and its methodological approaches. Hence, I have enclosed the study proposal for your perusal.

I would be grateful for a response agreeing for me to conduct the interviews. Your response will form part of my application to the Research Ethics Committee mentioned above.

I am thanking you in advance and looking forward to hearing from you at your earliest convenience.

Yours Sincerely,
Ngobeni MF



University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

APPENIX 2: Permission letter from Department of Health



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH

Enquiries: Latif Shamila (015 293 6650)

Ref:4/2/2

Ngobeni MF
UNISA

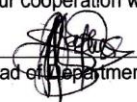
Greetings,

RE: Attitude of Community Members towards the Human Rabies in the Vhembe District, Limpopo Province, South Africa

The above matter refers.

1. Permission to conduct the above mentioned study is hereby granted.
2. Kindly be informed that:-
 - Research must be loaded on the NHRD site (<http://nhrd.hst.org.za>) by the researcher.
 - Further arrangement should be made with the targeted institutions, after consultation with the District Executive Manager.
 - In the course of your study there should be no action that disrupts the services.
 - After completion of the study, it is mandatory that the findings should be submitted to the Department to serve as a resource.
 - The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
 - The above approval is valid for a 3 year period.
 - If the proposal has been amended, a new approval should be sought from the Department of Health.
 - Kindly note, that the Department can withdraw the approval at any time.

Your cooperation will be highly appreciated.


Head of Department

12/06/2017
Date

18 College Street, Polokwane, 0700, Private Bag x9302, POLOLKWANE, 0700
Tel: (015) 293 6000, Fax: (015) 293 6211/20 Website: <http://www.limpopo.gov.za>

Open Rubric

The heartland of Southern Africa – development is about people

Informed Consent

Thank you for agreeing to participate in this study, which will take place from April 1, 2017 to June 30, 2017. This form details the purpose of this study, a description of the involvement required and your rights as a participant.

Title of study: Attitudes of community members toward the Human Rabies in the Vhembe district of the Limpopo Province, South Africa.

The purpose of this study is twofold:

- The proposed study intends to explore the attitudes of community members toward the Human Rabies in the Vhembe district of the Limpopo Province, South Africa.
- The proposed study also intends to develop a conceptual model for enhancing vaccination and immunoglobulin requirements among community members in the Vhembe district of the Limpopo Province, South Africa.

The benefits of the research will be: The significance of this study serves to improve the management and control of human rabies in the Vhembe district of the Limpopo province.

The data collection methods that will be used: Data will be collected using individual interviews and focus group interviews.

You are encouraged to ask questions or raise concerns at any time about the nature of the study or the methods that are being used. Please contact me at any time at the e-mail address or telephone number listed below.

You also have the right to withdraw from the study at any point. In the event you choose to withdraw from the study all information you provide will be destroyed and omitted from the final study report.

By signing this consent form, I certify that I ____ (Participant Name) _____ agree to participate in the study in terms of this agreement.

Date completed: _____

Researcher: Freda Ngobeni (Email: fredangobeni@yahoo.com) or Cellular no.0794911909

Supervisor/Advisor: _____

Ethics Approval No.: _____

Date: 17 December 2016

PARTICIPANT INFORMATION SHEET

STUDY TITLE: ATTITUDES OF COMMUNITY MEMBERS TOWARD THE HUMAN RABIES IN THE VHEMBE DISTRICT OF THE LIMPOPO PROVINCE, SOUTH AFRICA.

INVITATION:

You are being invited to take part in a research study. Before you decide whether to take part, it is important for you to understand why the research is being conducted and what it will involve. Please take the time to read the following information carefully

THE PURPOSE OF THE STUDY

The purpose of this study is twofold:

- The proposed study intends to explore the attitudes of community members toward the Human Rabies in the Vhembe district of the Limpopo Province, South Africa.
- The proposed study also intends to develop a conceptual model for enhancing vaccination and immunoglobulin requirements among community members in the Vhembe district of the Limpopo Province, South Africa.

WHY HAVE YOU HAVE BEEN INVITED TO PARTICIPATE?

You have been selected to take part in the study because of the following reasons:

You are a resident of Vhembe district in Limpopo province.

We believe that you can add value to the study.

DO YOU HAVE TO TAKE PART?

Taking part in the research is entirely voluntary. Kindly note that it is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason.

WHAT WILL HAPPEN TO YOU IF YOU TAKE PART?

If you agree to participate, you will be interviewed individual, and may participate in a group interview. The each interview will last about 40-45 minutes.

WHAT ARE THE POSSIBLE BENEFITS OF TAKING PART?

There are no immediate benefits for you if you participate in this study. The proposed study intends to assess your insight into the human rabies. The outcome will assist in reducing the number of people dying of rabies and controlling of the outbreaks of the disease.

CONFIDENTIALITY

Any information obtained in connection with this study will be treated as privileged, confidential and with respect. Information will not be released to any unauthorised person (s) without your prior consent. The information you provide will not be used in a way connected with you and will never be disclosed to anybody. The information obtained in this study will be used in my Masters thesis and may be published in appropriate journals. A copy may be made available on request or may be obtained from the University of South Africa's library once the degree has been conferred and the dissertation has been published.

WHAT IS THE ANTICIPATED INCONVENIENCE OF TAKING PART IN THIS STUDY?

The study will not include any personal or sensitive information. Anonymity will be protected at all times and no one will ever be identified. Therefore it is not foreseen that participation will have negative consequences.

WHO IS FUNDING THE RESEARCH?

I am conducting the research as a student at University of South Africa. I am pursuing a Master's degree at the University of South Africa.

WHO HAS REVIEWED THE STUDY?

The research has been approved by the Research, Ethics and Committee.

Name and contact details of the researcher:

Name of researcher: Ms Ngobeni

Contact details: 6513174@mylife.unisa.ac.za

Student Number. 6513174

CONTACT FOR FURTHER INFORMATION

Research Supervisor : Professor PT. Sandy(PhD)

Email : sandypt@unisa.ac.za

Thank you for taking time to read the information sheet.

APPENIX 5: INTERVIEW SCHEDULE: INDIVIDUAL INTERVIEW

Study Title: Attitudes of community members toward the Human Rabies in the Vhembe district of the Limpopo Province, South Africa. The absolute minimum number of questions will be asked to allow participants to tell their stories.

The researcher will commence the interview process by introducing herself, and clearly stating its purpose. Although confidentiality issues contained in the information sheet has been explained to the participant, these will be reiterated. Permission to record the conversation on audiotape will be sought underpinned by a clear rationale. Participants will be also encouraged to sign consent forms. This will be followed by the use of questions.

Questions:

- Please tell me about your experience and perception of rabies in this municipality.

Possible prompts: What happened? How do you feel? What else?

- In your view, what are the barriers to community members' compliance with the vaccination and immunoglobulin requirements for the prevention and control of rabies in in this municipality?

Possible prompts: What do you mean by staff shortages? Can you tell me more?

- In your view, what do you think would promote community members' compliance with the vaccination and immunoglobulin requirements for the prevention and control of rabies in in this municipality?

Possible prompts: Can you tell me more about... What about skills?

- What resource do you this municipality needs for tackling the problem of rabies?

Possible prompt: How can the situation be improved? In your view, how can an outbreak of rabies managed?

- What are your feelings about the current process of managing rabies in this municipality?

Possible prompt: Can you tell me more?

- What do you think are the "best ways" for preventing, controlling and managing rabies?

Possible prompt: Please elaborate on that point.

- What would you give to someone bitten by a dog?

Possible prompt: Please tell me more about that. What else? What about the signs and symptoms of rabies, are you aware of them?

Can you tell if a dog is infected with rabies?

Possible prompt: What else, and what would you do?

APPENDIX 6: INTERVIEW SCHEDULE: FOCUS GROUP INTERVIEW

Study Title: Attitudes of community members toward the Human Rabies in the Vhembe district of the Limpopo Province, South Africa

The absolute minimum number of questions will be asked to allow participants to tell their stories.

The researcher will commence the interview process by introducing herself, and clearly stating its purpose. Although confidentiality issues contained in the information sheet has been explained to the participant, these will be reiterated. Permission to record the conversation on audiotape will be sought underpinned by a clear rationale. Participants will be also encouraged to sign consent forms. This will be followed by the use of questions.

Questions:

- Please tell me about your experience and perception of rabies in this municipality.
Possible prompts: What happened? How do you feel? What else?
- In your view, what are the barriers to community members' compliance with the vaccination and immunoglobulin requirements for the prevention and control of rabies in in this municipality?
Possible prompts: What do you mean by staff shortages? Can you tell me more?
- In your view, what do you think would promote community members' compliance with the vaccination and immunoglobulin requirements for the prevention and control of rabies in in this municipality?
Possible prompts: Can you tell me more about... What about skills?
- What resource do you this municipality needs for tackling the problem of rabies?
Possible prompt: How can the situation be improved? In your view, how can an outbreak of rabies managed?
- What are your feelings about the current process of managing rabies in this municipality?
Possible prompt: Can you tell me more?
- What do you think are the "best ways" for preventing, controlling and managing rabies?
Possible prompt: Please elaborate on that point.
- What would you give to someone bitten by a dog?
Possible prompt: Please tell me more about that. What else? What about the signs and symptoms of rabies, are you aware of them?

Can you tell if a dog is infected with rabies?

Possible prompt: What else, and what would you do?